6/20/03

How do you know you've selected the best possible genetic DNA pool to enhance these fish. species. Would it not be best to get truly "wild fish" from the far reaches of Alaska to better develop a stronger genetically pool for our local salmon?

06/23/03

I am all for hatchery production for (especially South) Sound Salmon. I personally do not feel there would be any problems with competition for food if you were to put more emphasis on the food fish biomass to start with. Despite a lot of good returns, and successful spawning, all these fish all need the basics to survive, and having something to prey upon is at the top of the list. Kelp is being removed from sensitive areas that herring used to spawn on. Haven't seen much lately down here. Used to see huge numbers of sand lance migrating along the shores, again, nothing much these days. We/you need to take a long serious look at this, and then bolster the local fisheries down south.

07/02/03

One last query. While not referenced in the HGPMP, I assume that no Reiter Ponds hatchery fish are passed above Sunset Falls into the South Fork of the Skykomish. Is that correct?

07/03/03

The WDFW needs to take any extra fish eggs and use them to plant in various streams in the local area. This will help bolster the wild fish runs. There is no excuse for not doing this. WDFW needs to do as much of this as possible, but there is enough fishing groups out there to help. WDFW needs to put a message out to these groups for this help. There is no reason to give away eggs when it is more important that the naturally spawning fish get help. By changing, closing, or altering the sportsman's season is not the answer. INDIAN AND COMMERCIAL fishing need to help as well by getting rid of all nets. Nets are not selective as to the kind of fish they take. The indians especially are GUILTY of putting nets in such away as there is no way around .The indians block the mouth completely. This is TOTALLY WRONG! The WDFW needs to go to court and get changes to the Bolt decision asap.

07/01/03

Dr. Jeff Koenings, Director, WDFW

I have some concerns related to the artificial production of salmonids in the Baker River/ Skagit Systems.

Puget Sound Energy is in the process of applying for a new hydropower license and they have made the following proposals for the life of the license (30 to 50 years); artificial incubation and release of 20,000 Coho smolts, 25,000 steelhead smolts, 25,000 spring Chinook, and a target goal of 100,000 sockeye.

There is also a high probability that the Little Baker River will be restored to increase habitat and benefit the natural reproduction of salmonids.

The current hatchery production of steelhead in the Skagit River System is 200,000 smolts and there are no plans to increase production or improve hatchery facilities or methodology.

Several questions arise;

Will Puget Sound Energy be willing to support artificial fish production and natural/wild reproducing salmonids by creating habitat, providing nutrients, and sufficient water flows?

With the creation of fish habitat and spawning areas in the Little Baker River will there be sufficient separation of hatchery and wild stocks to prevent cross breeding?

Where will the steelhead smolt come from and where will they be released? PSE has not been able to clarify this proposal.

It is apparent that some clarification of PSE's intentions are essential and that some long term planning by WDFW is necessary.

Please consider these concerns while developing your HGMP.

07/02/03

In reviewing the Reiter Ponds Summer Steelhead Program, a couple of questions have arisen.

The first is likely to be a clerical error, but I'd appreciate a clarification. The cover sheet indicates that the hatchery stock originated from the Puyallup River. However, on Page 21 it indicates that the current brood stock was derived from Skamania River stock some 30 years ago. Though they've been bred for 20 years from Skykomish returns, the point of origin should probably be clarified.

In looking at the distribution of outmigrating smolts, I note that some 50K fish are distributed in or near the Raging River on the Snoqualmie side of the basin. Given the near demise of the Tolt River wild summer steelhead (probably due to the Seattle water impoundment on the South Fork) and concerns with building wild stocks on the Tolt, does the Department have any data concerning strays from this Raging River outplanting that may ascend the Tolt?

While the catch data that I've seen would seem to indicate that the majority of these hatchery summer runs ascend the Raging, I'm interested in any data that indicates major straying and potential interaction with wild runs on the Tolt.

07/15/03

Thanks for your assistance in getting clarification on the Reiter Ponds Summer Steelhead program. I now have a few questions regarding the Reiter Ponds Winter Steelhead program.

As I understand it, adults are trapped at Tokul Creek, eggs are hatched at Tokul Creek, fry are raised at the Wallace River hatchery and then transferred to Reiter ponds until smolt release throughout the Skykomish and Pilchuck Rivers. As such, brood stock are locally acclimated to the Snoqualmie branch of the Snohomish system? I assume this arrangement is necessary due to economic constraints and/or inability to effectively trap fish at Reiter ponds during winter flows?

Does the Department have plans to develop a local brood stock of Skykomish returns? While the Snoqualmie is part of the watershed, it's hardly comparable to the Skykomish in terms of geomorphology, water quality or benthic environment.

Also, on page 32 the text of HGMP states: "These summer steelhead are fish health certified....” That should probably be changed to 'winter steelhead' or deleted.

07/16/03

Newsflash! The Washington Legal Defense Fund For The Preservation of Wild Trees has filed a lawsuit against Washington State Department of Natural Resources claiming that their planting of nursery grown trees has resulted in the disappearance of 'wild' or natural trees. This practice must stop or all 'wild' trees will soon be a thing of the past. 'Wild' trees, while superior, cannot compete with their nursery-reared cousins.

Now, if the above seems ridiculous, it should - - - because it is, on several scores. Yet, we don't dismiss the identical 'wild' fish argument out of hand. Why? Is it because it has crept in slowly and been repeated so many times that we accept it because of familiarity? If so, and I strongly suspect that this is because I have observed it with horrified anticipation, then we are in deep trouble. It will be a classic in the future study of what a propaganda program can accomplish if any freedom should survive that would permit such an investigation.

The fish are gone because of mismanagement. We ate them. Hatchery fish are identical genetically with 'Wild' fish. There is no way to take the sperm and eggs from 'wild' fish and arrive at anything else. Think about that for a moment. Use the human analogy. Take sperm from a male and an egg from a female. Make a 'test-tube' baby. Is the baby not identical to one that would have resulted from intercourse? Now, are we going to put a label of 'wild' on Mom and Pop? I think not. Why do we allow the label with fish? It is a distinction without substance. It is a distinction that someone is desperate to make. Why? This is straight out of Adolf Hitler's Play Book. Hatchery fish are the Jews, and 'wild' fish are the Aryans. God forbid that they should intermingle and weaken the stock! Now, repeat the lie. (Over and over. That's right - - - once more).

For the sake of argument, assume that the hatchery fish are thinning out the gene pool because too many fish are being produced from a relative few fish. This is their only argument that has even a hint of merit (although it does not). I assert that the hatcheries are taking steps to change this, and if the hearts of the 'wild' fish people were pure, they would help come up with ways to help in this endeavor instead of trying to "throw the baby out with the bathwater." Their position belies a hidden agenda that we should all recognize by now.

Think about the gene pool argument. Is a river orders of magnitude different than a hatchery? Is the genetic variety in a river, if fish only breed with fish in the same river, really that pronounced? What about a short river like the Elwha? How about a tiny river or a creek? How about a backyard trickle that still manages to produce fish? Why haven't these fish died out because of inbreeding? The Hatfields of River A are not supposed to breed with the McCoys of River B. They only breed among themselves. Why don't both families' produce only inferior progeny then? Wouldn't a bumper year where conditions for survival of the newborn fish are ideal increase the chances of genetic problems in the future? It would have to if you believe the arguments of the 'wild' fish people because there would be more fish with similar genes!

We are supposed to wait thirty years for the 'wild' salmon stocks to return after the dams are removed on the Elwha River. Imagine, thirty years before anyone can say that this experiment was a success or, more likely, a failure. Uncle Joe Stalin must be smiling. A Thirty-Year Plan. And, he could only hope to keep the lid on things for five years at a time. But, the "useful idiots" will maintain the lie while the fools sit on their hands for thirty years and await the arrival of those hundred-pounders.

The hatcheries are the only reason that we have any fish left at all. They are not the cause of dwindling stocks. Not now. Not ever.

P.S. I know that the dam removal will be a failure because there are no bugs for the fish to eat. In the days of the large salmon, the skies were virtually black with bugs. For further ideas, please try www.conspairacy.com/fishing.motives.html.

07/17/03

I am providing comments regarding the examination of the HGMPs listed on the Washington Department of Fish and Wildlife's (WDFW) Web Pages with a comment deadline of July 18, 2003. I have used the excellent information sources provided by the Washington Trout Web Pages as a means for applying relevant literature citings to my comments and as a comparative independent analysis of the HGMPs.

There are a number of commonalties in most of, or all the HGMPs which make them ineffective tools for evaluation of the potential effects of hatchery releases on listed chinook. Listed stocks are the driving criteria for developing HGMPs that fulfill the NMFS requirements as outlined in the "Hatchery and Genetic Management Plan Template: Purpose, Applications, and Instructions" (January 5, 2002). That I am commenting on the HGMPs as a cumulative group, rather than individually, parallels the previous submission of them to NMFS in the "Joint Resource Management Plan for Puget Sound Chinook Salmon Hatcheries" (August 2002).

BASIC FAILURE #1:
No clearly identifiable goals are made in most of the HGMPs, although most suggest that individual programs have at least two goals: producing fish for harvest, and "minimizing adverse genetic, demographic, or ecological effects on listed fish." Such goals need to be more clearly described in order to effectively evaluate how each is achieving the well-defined goals. None provides evidence that alleged harvest-related benefits of the program can reasonably outweigh the potential risks to listed chinook.

BASIC FAILURE #2:
Sections 1.9 and 1.10 of the HGMP Template and NMFS Guidelines require descriptions of Performance Standards, Performance Indicators and related Monitoring and Evaluation programs and procedures for each HGMP. However, all of the listed HGMPs failed to provide or identify the quantitative measures required. The NMFS website for HGMPs provides the Independent Science Advisory Board (ISAB) review of the Draft Performance Standards and Indicators for Artificial Production in the Northwest Power Planning Council's Artificial Production Review in the Columbia River Basin (ISAB 2002-2, February 23, 2000 as a document for completing individual HGMPs. It provides the following:

* A standard is a quantifiable state or condition described in such a way that it is easy to determine whether or not it is being met;
* Indicators are a list of measurable metrics that bear directly on the quantitative determination as to whether or not the standard is being met (p. 6).

None of the HGMPs listed by WDFW provides these basic and essential requirements of describing performance standards and indicators relevant to program goals and objectives, particularly regarding quantifying potential levels of take and minimizing adverse impacts on wild fish. In the absence of these necessities, the HGMPs are too vague to fulfill the requirements of science as described by the ISAB.

For instance, the critical "numerical estimate" requirements for evaluation of unintentional or indirect take at the three basic salmonid life stages (egg/fry, juvenile/smolt, and adult) are too often described as "unknown," if addressed at all. This virtually eliminates the potential for science to occur as a predictor of outcomes.

BASIC INACCURACY #1:
Literature published by WDFW's own staff (Pearson and Fritts 1999) indicates that the HGMPs rely on an outdated and now disproven rule-of-thumb regarding the relative size difference between salmonid predator and prey. It had been considered that predation is limited to prey that are one-third or less the length of a predator. But Pearson and Fritts found that juvenile coho consumed chinook that were up to 46% of their length and attempted to eat chinook up to 58% of their length with frequent lethal consequences. They also cited studies that found steelhead predation on salmonids at 42%-44% of their lengths. And WDFW's own draft versions of a predation risk model for addressing these kinds of hatchery-based risks to wild populations rely on the 46%-58% as Pearson and Fritts (1999) indicate for coho. Yet this is not used in the HGMPs.

BASIC INACCURACY #2:
It is assumed in the HGMPs that hatchery juveniles are released and migrate several weeks prior to the assumed period of wild juvenile outmigration. In fact, the majority of WDFW data from reports of downstream trapping on the Skagit, Cedar and Green rivers and Bear and Issaquah creeks in the Lake Washington system (Seiler et al. 2002a, 2002b, 2003) show that wild chinook outmigration is more or less continuous with several small modes scattered from mid-March to mid-June. These same fish will be available (as documented in other state and tribal reports) in estuaries and nearshore marine habitats for several more months (e.g., Beamer et al. 2000). This means a period of up to six months in which problems with competition and predation by hatchery juveniles will occur, with wild juveniles primarily suffering the outcome through take.

BASIC MISSING FACTOR #1:
There is no information provided in the HGMPs from which to determine the length-frequency distributions of juvenile hatchery releases in a manner that can be used to evaluate potentials for competition with and predation on wild chinook fry and fingerlings as determined by size differences. Hatchery releases are typically quantified by fish per pound (or sometimes average lengths), with no usable conversion factors to get at the necessary hatchery/wild evaluations. In the case of hatchery steelhead, a WDFW report ("Study Travel Rates of Hatchery Smolts") has stated hatchery steelhead smolts are typically 4-7 fpp. That equates to around 200-166mm (fl). This means they are all large enough to eat most wild chinook juveniles encountered. This was not included in the HGMPs, nor similar necessary information for other species.

BASIC MISSING FACTOR #2:
There is no information provided in the HGMPs stating the size distributions of juvenile wild fish in each case where hatchery fish of the same species are being released. Problems with competition and predation are much greater when hatchery fish released are significantly larger than their wild counterparts. This lack of comparative information makes it impossible to develop estimates of the probable extent of the competition and predation impacts of hatchery juveniles on wild juveniles due to proposed hatchery releases.

BASIC MISSING FACTOR #3:
The HGMPs are mute regarding implications of premature releases of hatchery fish. Early releases have a tendency to residualize due to not being ready for migration. While rarely evaluated, downstream trapping in Issaquah Creek in 2000 (Seiler et al. 2003) estimated that 28,000 chinook and 32,000 coho escaped prior to their respective release dates. Such fish typically remain in the river, preying on smaller rearing salmonids that include listed chinook among them. There is nothing in the HGMPs from which to evaluate the frequency of these occurrences.

THE LARGER VIEW:
There is the potential for the individuality of each HGMP to cloud the larger picture. Each must be kept in context with the whole. The sheer fish numbers represented by the hatchery program for Puget Sound as compared to the smaller wild chinook populations it dominates always threaten to draw an unequal attention to them by both users and managers. This threat has manifested itself in the HGMPs with a clear trend toward ignoring information from which hatchery program effects to the smaller wild chinook populations can be effectively assessed.

In the examination of the best available numbers for Puget Sound hatchery chinook from the combined sources of the RMP and individual HGMPs, the hatchery program has a planned annual release of 45.6 million fingerling chinook and 2.6 million yearling chinook. Lacking better available estimates, Washington Trout recently provided an estimate that the average annual production of "wild" juvenile chinook is less than 7 million fish (fry plus fingerlings), with several million of these coming from hatchery origin parents, given the significant stray rates documented for Hood Canal streams and for most large rivers in Puget Sound. If this is correct, wild origin juvenile chinook are only 14.5% the numbers of hatchery chinook. And a considerable percentage of these are actually progeny from hatchery chinook that strayed into the wild.

Hatchery program domination has been the historical partner to the regional decline of wild Puget Sound chinook, and this co-partnership in that trend of decline largely continues. There is one exception, that being the Upper Mainstem Skagit chinook.

In 1980 and again in 1990, Seattle City Light (SCL) radically changed the operation of the Upper Skagit dams with increased commitments of flow to better accommodate salmon spawning and rearing. It is apparent there has been a shift of wild Skagit chinook production increasingly into that section upstream of Rockport. Between 1974-1984 the percentage of the overall wild Skagit chinook population that spawned upstream of Rockport was 62%, between 1985-1993 it was 73%, and between 1094-2001 it was 78% (Connor and Pflug 2003). The information for this came from WDFW in 2003.

It is further shown that this sub-stock of chinook is the only one in the watershed that has remained in stable numbers in the period of spawning survey record between 1974-2001. For comparison, these same data indicate that the percentage of change in mean escapement between the 1974-1984 time period and the 1985-2001 time period was +3% for the Upper Skagit while it was -41% for the Lower Skagit and -52% for the Lower Sauk River, the major wild chinook spawning tributary to the Skagit. So while the Upper Skagit wild chinook have remained stable, or increased slightly, the remaining basin has been in significant downward decline. Also of interest, the overall average wild Skagit chinook population escapement has remained about the same between 1974-2001: between 1974-84 it was 12,112, between 1985-93 it was 10,279, and between 1994-2001 it was 11,526. This is only thanks to wild chinook productivity increasingly carried by the Upper Skagit.

Also beginning about 1980, SCL mitigation investments became increasingly focused on habitat acquisitions with related habitat protection, habitat restoration, or habitat re-creation projects (personal communication Dave Pflug 2000, 2001, 2002). This contrasts with hydroelectric dam mitigation for fish losses more commonly realized in the form of hatchery programs elsewhere. While Upper Skagit wild chinook have remained stable, primarily from habitat investments as a priority over hatchery releases, the rest of the Skagit basin has remained in wild chinook decline at the same levels as other Puget Sound areas where habitat investments have most often been lower and hatchery domination commonly higher in those other river basins.

Perhaps as a result of habitat protection/restoration emphasis over hatchery production, the Skagit system is the only place in the Puget Sound region where wild fish have a clear production advantage. Seiler et al. (2002a) show that the 12-year (1989-2000) annual production of wild fry and fingerlings averaged 2.8 million fish. This compares favorably with a relatively modest hatchery program planned for 672,000 fingerlings and 150,000 yearlings. The circumstantial evidence suggests that on the Skagit, where emphasis has been on moderation of hatchery chinook production, the result has been comparatively high wild fry and fingerling production.

One can't help but wonder what wild Skagit chinook production might be if chinook, coho, and steelhead hatchery production were all reduced or eliminated and the hatchery funding was shifted to Lower Skagit habitat purchases and habitat restoration, combined with WDFW negotiative emphasis focused on Puget Sound Energy's (PSE) Baker River dams to better stabilize Lower Skagit flows -- essentially a building on the implications of the successful Upper Skagit planning. While this is apparently not a feasible consideration for the Skagit coho and chinook HGMPs due to stated limitations agreed to by international treaty obligations regarding hatchery production and related international harvest balances, it at least remains a consideration for steelhead HGMP modifications toward lowered or eliminated production on the Skagit as a potential alternative provided through the HGMP Template (Section 1:16).

However, this is not among the steelhead HGMP considerations for the Skagit, or for any other HGMP for any species outside the Skagit where international treaty obligations are not a concern. There is no mention of this existing Upper Skagit information as an alternative for application to basins outside the Skagit international treaty constraints. Alternatives might include eliminating certain hatchery programs with subsequent reinvestments of their past funding into negotiations and trade-offs in operation of

hydro-electric dams; greater investments in habitat acquisition for protection and reclamation; and reduction or elimination of hatchery salmonid fry, fingerlings, smolts and residuals with increased survival of wild juvenile chinook.

In contrast to the Skagit, estimated wild chinook juvenile production in the Green River was estimated at 1.08 million by Seiler et al. (2002b). At least half were probably from hatchery parents. This is dwarfed by a hatchery program that releases 3.7 million chinook fingerlings and 410,000 yearlings, for more than 4 million total.

The hatchery-to-wild chinook disparity reaches an extreme in Hood Canal. The HGMPs for the area identify the Skokomish River as the primary wild chinook juvenile producer, but the estimate is only 104,400 fish per year, and that mainly from hatchery parents. Hatchery releases in the same area are 7 million fingerlings and 475,000 yearlings. The Elwha and Dungeness rivers have similar disparities to the Skokomish regarding hatchery-to-wild juvenile numbers.

Washington Trout information suggests the Nooksack may have similar wild chinook fry and fingerling production to the Skokomish at 100,000 fish, while hatchery releases planned for Bellingham Bay tributaries total 5.8 million fingerlings and 100,000 yearlings. Again, astonishing disparity in numbers between wild and hatchery.

The only major river in Puget Sound that appears to have HGMP planning that is anything close to the situation on the Skagit River regarding proportions of planned hatchery chinook releases to the juvenile wild population is the Stilliguamish. Although the 200,000 fingerling hatchery chinook program seems modest, Washington Trout has made estimates that it nevertheless doubles the wild juvenile chinook population in the Stilliguamish.

All of the indigenous chinook populations of Puget Sound appear to have current juvenile production that is far below potential due to persistently low spawning escapements. On the Skagit River, in two of 12 years, it demonstrated the ability to produce 6 million fry and fingerlings. But the average over this period of time was only 2.8 million (Seiler et al. 2002a). Wright et al. (1973) estimated that a modest sized coastal river basin of 245 square miles (a fraction of the Skagit basin's size), was estimated at the 95 percent confidence level to have produced between 1.8 and 4 million wild chinook fingerlings in 1972 (and it had no hatchery at the time).

One might well ask, "Do hatchery releases lead to replacement of wild chinook by hatchery chinook with no total gain in numbers and eventual extinction of the indigenous population?" Certainly the juvenile chinook evidence points in that direction.

The primary causes for wild chinook replacement and for its continuation may be due to a past history that is being repeated in the HGMPs: the refusal to develop the necessary information from which to determine the effects of competition and predation due to releases of hatchery juveniles. At this point in time, listed wild chinook fry are of necessity a key management driver. They are generally smaller and less able to compete and to avoid being eaten in company with hatchery cohorts of their own and other species. This is the very purpose for NMFS requiring the development of the HGMPs. WDFW has missed the point of the exercise.

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07/17/03

I have examined the Marblemount Winter Steelhead Program HGMP. The Skagit River's wild chinook, as part of listed Puget Sound chinook, are important to me. So too are the wild winter steelhead in the Skagit which have crashed in numbers the past four years.

I do not have the time or resources to fully review all the HGMPs, so I have chosen the Marblemount HGMP as my choice for response from among the list on the Washington Department of Fish and Wildlife's WebPages with a solicitation for public responses through July 18, 2003.

Because of my lack of time to fully research scientific sources to support my concerns, I used what Washington Trout was able to provide me in their own response to the Marblemount HGMP. It is obviously science-based and concurs with my Skagit River concerns. I have attached Washington Trout's response remarks as if they were those of my own. Essentially I am using Washington Trout's response to the Marblemount HGMP as my sole scientific citing because it best fits as a defining reference to the problem.

Attachment on the following pages

Comments on Wallace Summer Fingerling Chinook Program HGMP
To be submitted to WDFW July 18, 2003
On behalf of Washington Trout
by
Nick Gayeski and Ramon Van den Brulle
DRAFT: 7-11-03

Section 1. General Program Description.

Subsection 1.5
The response is incomplete and fails to comply with NMFS' HGMP Completion Guideline E, which is specifically referenced in the HGMP Template.

1.7
Most importantly, no program goals or objectives are clearly articulated. The program is merely characterized with the single word "augmentation". No motivation is provided in regard to the following implicit fundamental questions: *Why is harvest augmentation an appropriate or valid goal? Why does it need to occur at the Wallace facility or even within the Snohomish River Basin?*

Elimination, reduction, or minimization of the risk of adverse impacts of the facility and of program activities on listed Chinook is not listed as a program goal, though it is implicitly considered as such later in the HGMP. This goal needs to be clearly stated and explained in appropriate detail in this section, essentially at the beginning of the HGMP.

Several critical assertions are made here in the attempt to describe features of the augmentation program that are simply unexplained and unsupported within the response. *How* does WDFW propose to provide NOR/HOR ratios on the spawning grounds using the 600,000 "mass marked" hatchery releases? What are the details of the monitoring plan that will provide that information? What modeling will provide an index using the DIT group for wild Chinook? How has it been proofed? How will WDFW analyze data on "catch contributions, run timing, total survival, migration patterns and straying into other watersheds?" What performance standards will those data be applied to, and how will WDFW respond to information provided by the data?

Subsection 1.8. Justification for the program.

On its face, this response appears inappropriate, and would be better included in the response to SS 1.7. It describes two goals of the program, providing fish for harvest and minimizing "adverse genetic, demographic or ecological effects on listed fish", without providing justification for either. Why is it socially, economically, or biologically necessary, advisable, or even beneficial to provide fish for harvest using this program at this facility? Perhaps WDFW takes it for granted that providing fish for harvest is justification in itself, but NMFS should not have to when evaluating this program, nor, certainly, should the public.

There likely are several and varied justifications for providing fish for harvest. They should be listed and described in sufficient detail to be evaluated and weighed objectively against all direct and indirect take of listed species likely to occur as a result of the program.

Further, taking for granted some general need for "fish for harvest" provides no kind of justification for any particular program, including Wallace River Summer Chinook Fingerlings. Presumably, "fish for harvest" can be provided in any number of ways at any number of places. This response should describe why it is necessary to produce chinook fingerlings for harvest at Wallace River under the specific protocols proposed – again, in order that such justification can be *weighed against* the risk of potential take that may occur, relative to other options, including discontinuing or scaling back the program.

Presumably, relative to take authorization, the standard of justification for an integrated harvest/augmentation program should be higher than for a recovery, preservation/conservation, or

research program, or at least different. One should expect at best a very low level of biological “benefit” from a harvest/augmentation program. Therefore, a relatively high level of social and/or economic “benefit” should be described in detail in order to justify any biological risks of the program to listed Puget Sound chinook.

WDFW appears to assume one or both of two things: that because the existing Wallace River Fingerling Program predates the listing of Puget Sound Chinook, the “benefit” of raising fish for harvest at Wallace River has already been established, and should not require detailed explication; or that the assertion that the existing program will be run (or has been run) in order to “minimize adverse… effects on listed fish” is adequate to justify continuing the program. To be fair, guidance offered by NMFS in the HGMP template could be interpreted to imply as much. Nevertheless, Washington Trout considers both of these assumptions counterintuitive, and a misreading of both the spirit and the specific requirements of the 4d Rule and the HGMP template.

At any rate, the response for this subsection of the HGMP lacks detail sufficient to assure that the program will result in "adverse genetic, demographic or ecological effects on listed fish" being contained within quantifiable limits that can reasonably be considered to be "safe." The mere assertion that the Department's intention is to "provide fish for harvest while minimizing adverse… effects on listed fish" is insufficient.

Washington Trout believes that quantitative standards that provide clear threshold levels of potential adverse impact to be avoided need to be stated and then clearly linked to quantitative monitoring variables.

To its credit, the response includes five distinct points describing aspects of program operations that are intended to reduce potential adverse impacts of the release of hatchery fingerlings on listed chinook. However, we believe that these points fail to include or refer to appropriate measurable quantitative standards and/or rely on dubious or unjustified assumptions about the sources of adverse impact and how they may best be minimized. Further, the fact that these points are repeated *verbatim* and without extensive case-specific qualifying information in nearly every HGMP suggests that they are a boilerplate substitute for thoughtful analysis.

In the context of the ESA it is insufficient merely to assert that program operations will endeavor to minimize adverse impacts to listed species. It is necessary to quantify the level of take likely to result from these operations; that is, it is necessary to quantify the amount of take that is expected to result when program operations are configured so as to produce a "minimal" level of impact. NMFS in its January 5, 2002 guidance document titled *Hatchery and Genetic Management Plan Template: Purpose, Applications, and Instructions,* clearly directs HGMP applicants to supply a “numerical estimate” of expected take from hatchery operations “as best as possible” (paragraph G).

Point #1 asserts that juveniles will be released as smolts to minimize time of emigration from freshwater to saltwater so as to minimize potential competition and predation on listed fish. This fails to address several relevant issues in sufficient detail. It ignores the issue of relative size between released hatchery smolts and wild conspecifics. Both competition and predation are dependent upon the relative sizes of the individuals involved and hatchery smolts are generally released at sizes significantly larger than wild juvenile conspecifics of the same age.

Both competitive ability and predation potential need to be explicitly considered in order to evaluate the extent to which the time of release and the duration of migration to saltwater of released hatchery fish may negatively impact wild listed juveniles. This requires, at a minimum, that the relative sizes of released hatchery smolts and wild listed juveniles be specified and then evaluated with respect to potential levels of competition and predation. Moreover, it is important to specify the expected *distribution* of sizes of released hatchery smolts and of wild listed juveniles that may be affected by the released smolts and to specify the absolute numbers of hatchery releases relative to both the expected numbers of rearing and migrating listed juveniles and the capacity of the river basin for rearing listed juveniles.

It is inadequate to assume that there is a single size (i.e., the mean size) of hatchery smolts at the time of release and that there is a single (mean) size of wild listed juveniles during the time of emigration of hatchery smolts. The respective distributions of sizes is needed in order to properly estimate the likelihood of competitive displacement and/or predation by hatchery smolts on wild listed juveniles during the period of freshwater emigration of released hatchery smolts.

Point #2 asserts that juveniles will be released after the usual time of emigration of wild chinook smolts in order to minimize potential adverse interactions. This implies a gross over-simplification of the temporal distribution of the migration of wild listed juveniles from freshwater to saltwater habitats. Recent data on the timing of wild juvenile chinook outmigration in mid-Puget Sound rivers gathered by the Department's own Wild Salmon Production Evaluation Unit (WSPE) (Seiler et al. 2001(a), 2001(b), 2001(c), 2002, and 2003) provides substantial evidence that wild juvenile chinook downstream migration generally occurs over a protracted period of time ranging from February to July. The majority of this data is noteworthy in displaying no pronounced mode in the timing of wild chinook outmigration. Rather, outmigration appears to be more or less continuous with several small modes scattered from mid-March to mid-June. This makes it extremely unlikely that hatchery smolt releases can be scheduled to occur "after the usual wild chinook emigration time" as asserted by point #2, unless hatchery releases occur in late July.

Point #3 asserts that straying of returning hatchery-origin (F1) adults will be minimized by acclimating released juveniles "at a hatchery facility capable of trapping the majority of returning adults." This assertion glosses over several critical issues and recent data indicating that straying of returning adult Wallace River Hatchery summer chinook in the Skykomish and Snoqualmie River Basins is significant.

The assertion that the Wallace Hatchery facility is capable of trapping the majority of returning adults is inappropriately vague in as much as it can be satisfied by trapping 51% of F1 adults returning to the hatchery trap, and would only apply in any case to those fish that entered the Wallace River on which the hatchery is located and migrated upstream as far as the trap. Even so, recent data demonstrates that hatchery-origin fish spawning in the Wallace River has been considerable, indicating that significant numbers of hatchery fish that actually enter the Wallace River are not caught in the trap.

Importantly, no threshold target level of straying (maximum acceptable % hatchery-origin adults present on the spawning grounds with listed adult chinook) is mentioned, much less discussed, in this context. Specification of such a standard in conjunction with specification of a detailed plan for monitoring stray is essential if a hatchery program is to have the ability to identify adverse impacts on listed fish in a timely manner and contain them within biologically acceptable limits. Even this, however, is not enough. It is necessary in addition to specify the appropriate and timely management response that is to occur when the limit standard is exceeded.

Although the stringent Wild Salmonid Policy standard of 4% is subsequently listed in the Table of performance standards, indicators, and monitoring and evaluation in subsection 1.10 (pp. 3 – 6), no associated monitoring plan is subsequently described. Neither is there any description or discussion of any management responses that would be taken to correct in a timely, risk-averse manner violation of the limit standard.

We agree that the upper bounds on the acceptable percentage of hatchery-origin strays on natural spawning grounds should be set at those listed in the table on pp. 3 - 6 so as to comply with the Guidelines delimited in the Department's Wild Salmonid Policy Additional Guidance (Table 2, page 16). However, we suggest in addition that specific proportional reductions in hatchery releases be examined and delineated as responses to corresponding percentage-exceedence of the acceptable upper bound on straying.

Point #5 asserts that harvest rates on hatchery-origin adults from the program will be managed to allow for "adequate escapement of listed chinook". Absent a clear specification of what constitutes an "adequate" escapement of listed chinook this point contains no identifiable standard. In this context, a biologically credible numeric minimum escapement level is required. A clear quantitative standard is required so that hatchery managers, NMFS, and the interested public can tell whether or not the

escapement observed in any year is "adequate". In addition, a clear specification of the management actions that will be taken when escapement fails to attain the desired minimum level should be provided.

Further, the response fails to describe *how* WDFW has determined that the assertions contained in each of these five points is true or likely to be true, or describe to what extent they are true. How does releasing juveniles as smolts minimize emigration time? How effectively does it achieve this objective? How effectively has WDFW's acclimation practices minimized straying? How will the practices proposed differ from past practices, if at all?

Guidance from NMFS on completing the HGMP Template directs applicants to "cite relevant reports… or other analysis (sic) or plans that provide pertinent background information to facilitate evaluation of the HGMP," and to "provide additional support of critical information" submitted in the HGMPs. The justification for the program would appear to be critical information, yet WDFW provides no citations or documentation to support the assertions made in the response.

In sum, it appears that the combined responses to SS 1.7 and SS 1.8 constitute no more than an *inadequate* response to SS 1.7. As a result SS 1.8 is essentially left *unanswered.* As noted above, without an adequately described *justification* for the program, there is virtually no way for federal regulators or the public to evaluate or weigh the potential risks of the program against any supposed benefits, regardless of the scope or probability of those risks. This shortcoming alone would appear to render this HGMP application inadequate for federal approval.

Subsections 1.9 and 1.10 (List of program "Performance Standards" and "Performance Indicators".

The Table on pages 3 - 6 listing performance standards, indicators, and Monitoring and Evaluation Plan in general either fail to be standards or indicators, or are stated at an inappropriate level of generality. We instance the following as examples.

"Produce adult fish for harvest" is not a *bone fide* standard, but at best is a program goal. A Performance Standard would be "produce an annual average of 10,000 adult fish age 3 to 5 for harvest by combined fisheries in Alaska, West Coast Vancouver Island, the Washington Coast, Strait of Juan de Fuca, and Puget Sound." A Performance Indicator corresponding to this standard might be "achieve an average annual release of 1,000,000 fingerling smolts with an annual mean survival rate of 1%. A Monitoring and Evaluation Plan for these standards and indicators would describe the methods by which catch will be monitored and survival rates estimated.

On page 4, "manage for adequate escapement" is a goal not a performance standard, and "hatchery and wild return rates" is not a performance indicator, but rather a statement of possible parameters that could serve as indicators and might be monitored. A Performance standard here would be "manage annual release levels and associated harvest rates so as to achieve an average annual escapement of at least 6,000 natural origin (listed) adult spawners including at least 3000 females of which a maximum of 10% are three-year olds. In addition, manage release levels and harvest rates so that no more than 4 % of the total annual spawning population is composed of hatchery-origin adults." A Performance indicator associated with such a standard might be "the minimum number of natural origin spawners observed in index reaches A,B, and C, are at least X,Y, and Z with a percentage of females age 4 and older of 90%". A corresponding Monitoring and Evaluation Plan would include a specification of index areas and frequency of spawner counts during the course of the spawning season together with a description of sample methods and associated sample sizes for estimating ages, sex ratios, and percentage of hatchery-origin fish.

On page 5, the remarks under the heading Monitoring and Evaluation Plan corresponding to the standard "Minimize interactions with listed fish through proper rearing and release strategies" contain no measurable criteria and no actions associated with attempts to measure impacts of hatchery releases on listed juveniles. Even the statement "CWT data and mark/unmarked ratios of adults" fails to specify a

number for the ratio, much less how such a ratio is to be estimated and where and when it will be measured.

(It should be noted here that one of the "performance indicators" listed for this standard, "Out-migration timing of listed fish / hatchery fish, *unknown/*June" (emphasis added), seems to contradict one of the "justifications" listed for the program in SS 1.8. If the out-migration timing of listed wild chinook is unknown, it seems unlikely that hatchery managers can reasonably claim, let alone assure, that "juvenile chinook will be released after the usual wild chinook emigration time to minimize potential adverse interactions," as stated in SS 1.8.)

None of the items listed under the heading Performance Indicator is clearly stated as an indicator nor is any one of them obviously relevant to the goal (not a standard) of minimizing adverse interactions with listed fish. A modicum of biologically relevant argumentation is required to make a case for the relevance of these items, and such argument has nowhere in this HGMP been made.

The associated Performance indicator of 70 fpp raises another important issue for this and all HGMPs. Fish-per-pound is hatchery management jargon and not clearly understood by the public. Moreover, where length is of direct relevance to issues such as predation and competitive interactions among conspecifics, number per pound cannot be directly translated into length or weight without specification of the condition factor of the released fish. We therefore recommend, first of all, that the Fulton condition factor, K (=W(grams)*100/(L(cm)^3) be reported together with both the number of fish per pound and the length in centimeters or millimeters that is associated with the number per pound at the given condition factor. Second of all, we recommend that the distribution of condition factor, length, and numbers per pound be provided for all hatchery releases discussed in the HGMP. Information about the size range of released hatchery juveniles in conjunction with the size distribution of rearing and migrating listed juveniles is critical in estimating the likely adverse impacts of hatchery releases.

Subsection 1.11. Expected size of program.
1.11.2. Proposed annual fish release levels.

The HGMP complies by listing in the table the total number of fingerlings to be released annually. While this complies with the letter of the HGMP template, it fails to provide either NMFS or the public with enough information to properly judge the scale of the hatchery releases and their potential direct and cumulative impact on listed fish in the river basin in which the releases occur and in the associated estuary and Puget Sound nearshore environments. Some sense of the scale of hatchery releases relative to the number of wild listed juveniles likely to be present in these environments during and shortly after the time of hatchery releases is required in order to adequately judge the size of the program and assess the potential contribution of the releases from specific programs and facilities to the cumulative impact of hatchery releases on listed fish.

We therefore recommend that in addition to listing hatchery facility releases an estimate also be made of the total numbers (by species) of wild salmonid juveniles (listed and unlisted) that are expected to be rearing in and migrating out of the river basin in which the releases are planned to occur. We further recommend that the HGMP list estimates of the numbers of hatchery juveniles of each species of salmon that are expected to be migrating through and rearing in the nearshore of Puget Sound or Hood Canal between the mouth of the river on which the hatchery in question is located (or in which the hatchery releases occur) and the entrances to Hood Canal and Puget Sound and that these numbers be compared to estimates of cumulative numbers (by species) of wild juveniles. Only this kind of comparative data in addition to the numbers of juveniles proposed to be released by the facility for which the HGMP is written can provide NMFS and the public with the appropriate sense of the expected size of the program.

1.12. Current program performance…

The HGMP provides a bare minimum of data as an answer to the narrow list of candidate indicators provided in the subheading (smolt-to-adult survival rates, adult production levels, and escapement levels). No discussion or analysis accompanies the data reported at the top of page 7. A smolt-to-adult survival

rate for the 1985 brood year of 0.10% is given. No discussion accompanies this to indicate how this number is related to a performance standard or indicator or even whether such a survival rate is acceptable, expected, or a matter of concern.

Escapements to the hatchery rack for broodyears 1995 to 2001 are listed. All are in excess of the broodtake goal of 900 pair stated on page 6, some considerably so. Nothing is said at this point concerning the disposition of the excess spawners. Since high proportions of hatchery adults present on the spawning grounds with listed adults in the Skykomish River basin, including the Wallace River on which the hatchery is located, is an acknowledged concern of the co-managers and NMFS the disposition of these surplus adults would appear to be of direct relevance to the description and assessment of program performance. Guidance offered by NMFS in the HGMP Template directs applicants to provide escapement data that includes escapement to the hatchery *and* natural areas (emphasis added) for the most recent 12 years. Data for escapement to natural areas are not provided, and the data provided cover only six years. Neither of these omissions are acknowledged or addressed.

We believe that more is required in addressing this subsection of the HGMP than has been provided, including a description of a monitoring and evaluation plan that has been (or will be) employed in measuring program performance. Such a monitoring and evaluation plan should include features that monitor program impacts on listed fish. This will require clear statements of measurable performance standards and performance indicators. It will also require statements of appropriate management responses when specific threshold levels of indicators are attained (or fail to be attained, depending upon the manner in which the indicator is stated).

We suggest that the following be included in assessing program performance.

1) Stray rates (% hatchery spawners present on spawning grounds with listed fish in specific subbasins): clear upper bounds that are in compliance with the Wild Salmonid Policy guidelines.
2) The proportion that the annual number of released hatchery juveniles bears to the estimated annual number of listed conspecific juveniles within the river basin or subbasin where the hatchery releases occur: a clear upper bound combined with a scaling of the absolute number of hatchery juveniles released to the estimated juvenile freshwater carrying capacity of the basin.
3) Hatchery smolt-to-adult survival rates, and wild smolt-to-adult survival rates. A lower limit to smolt-to-adult survival rates for hatchery fish should be established. Determination of an appropriate limit should include fitness considerations. Fitness considerations should include considerations of the long-term viability and productivity of the hatchery stock and considerations of the impacts on listed fish of interbreeding with hatchery strays at the upper acceptable level (specified under #1 above). A minimal, biologically acceptable lower limit on hatchery smolt-to-adult survival, however, cannot be purchased at the cost of significant size/condition differentials at the time of release between hatchery and listed juveniles. Limits (performance standards) need to be set on both the maximum size/condition differential between hatchery and listed juveniles and the minimum smolt-to-adult survival rate of hatchery juveniles. Both are required to assure that the program goal of minimizing adverse impacts on listed fish can be attained.

In addition, a minimum wild smolt-to-adult survival rate should be established that would be sufficient to insure the recovery and long-term persistence of local in-basin populations. Estimation of this rate should take into account the modal value of age-specific female fecundity, the adult population age-structure and sex ratio, the expected range and distribution of variation in survival rates between egg deposition and adult return, and expected harvest impacts. While the role which hatchery releases may have in depressing wild smolt-to-adult rates may be unknown or controversial, it is certainly unexamined and un-monitored. Knowing whether and to what extent this may be occurring would appear to be essential to providing an acceptable evaluation of the performance of a hatchery program. This cannot occur without establishing a performance standard for wild smolt-to-adult survival.

Subsection 1.16. Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

The HGMP provides no answer whatever to this important question. This is a serious deficiency.

One of the program goals is to conduct hatchery operations so as to minimize potential adverse impacts on listed fish. Significant thought should be given to ways in which facility operations might be altered or other program goals modified so as to achieve the goal of minimizing potential adverse impacts. These should be enumerated and discussed here together with a statement of reasons for not adopting such changes. At a minimum considerable detail should be provided to support a claim that current operations and goals are sufficiently protective of ESA concerns.

We suggest that the following be considered among the kinds of changes that would better satisfy the goal of minimizing potential adverse impacts on listed fish. 1) reducing the proposed number of juveniles released until stray rates within the basin are reduced to within the Wild Salmonid Policy guidelines (as described in the Table in subsection 1.10); 2) changing rearing practices so as to produce juveniles that are similar in size and condition to wild conspecifics likely to be rearing in and migrating from the basin during the time of release; 3) within the limits of the facility, releasing juveniles over a more protracted period of time to more closely approximate the temporal distribution of wild juvenile migration, in order to avoid overwhelming wild juveniles with one large pulse of hatchery juveniles; 4) in combination with reducing or eliminating releases from the Wallace facility into the Snohomish River Basin, release fingerling Chinook reared at Wallace in other Puget Sound river basins lacking indigenous, listed Chinook populations.

NMFS' Template clearly requires that such alternatives be described and considered and "reasons why those actions are not being proposed" provided.

It is worth noting that subsection 2.2.2 (pp.8-9) states that "[n]ew information indicates that there are substantial numbers of hatchery fish spawning in the wild with 30% to 50% of the spawners in the Skykomish River and approximately 10% in the Snoqualmie portion of the basin being of hatchery-origin". This considerably exceeds the 4% stray rate standard listed on page 4 and would clearly seem to require that careful consideration be given as to how to immediately correct this situation. Subsection 1.16 would clearly appear to be the place to do so!

Section 2. Program Effects on ESA-Listed Salmonid Populations.

2.2.1) Description of NMFS ESA-listed salmonid population(s) affected by the program.
This response does not adequately address the guidance provided by NMFS in the HGMP Template. The response fails to describe, as directed by NMFS: "adult age class structure, sex ratio, size range, migrational timing, spawning range, and spawn timing; and juvenile life history strategy, including smolt emigration timing." The response does not address, let alone emphasize, "spatial and temporal distribution relative to hatchery fish release locations and weir sites."

None of this information could be considered incidental to evaluating whether hatchery operations at Wallace River are being managed to minimize adverse effects on Puget Sound chinook. The omission of this critical information is a serious shortcoming of a publicly reviewed application for take authorization. While it may be assumed that NMFS already has the requested information, without this information, the application lacks adequate transparency. If these data are unavailable, or inadequate for inclusion in the application, then serious questions arise about the appropriateness of the program at the proposed scope.

Subsection 2.2.2) Status of ESA-Listed salmonid populations affected by the program.

Recent 12 year productivity and/or survival data. "1.358: 1 for 1990 to 1999" without further qualification is provided in response. Presumably this is a progeny-to-parent (adult recruit-to-spawner) ratio. But this is unclear in the absence of any explanatory comments and supporting data. The HGMP template explicitly asks for the source of these data.

In view of the acknowledged concerns regarding high levels of straying of Wallace hatchery stock within the Snohomish Basin, there is reason to suspect that adult recruit-to-spawner ratios for this period (prior to otolith and adipose clip marking) could be inflated by counting hatchery-origin spawners among the wild spawners. In any case, in the absence of a more thorough response to the question, the number provided is uninformative.

The same concern about counting hatchery-origin F1 adults among natural spawners exists for the figures provided for the most recent 12 year annual spawning abundance estimates. Only one of the 11 years of data provided (6304 for 1998) exceeded the spawning escapement goal for the Snohomish Basin of 5250, but even this figure is likely inflated by hatchery-origin adults. This suspicion is supported by the recent Draft of the updated Chinook Status Review by NMFS Biological Review Team ("Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead A. Chinook salmon. February 2003. Co-manager review draft"). Figure A.2.4.1, page 45 shows approximately 1400 natural origin spawners among a total of approximately 1900 total spawners in 1998 in the Snoqualmie River and approximately 1600 natural origin spawners among a total of approximately 4400 total spawners in the Skykomish river, the two largest spawning areas in the entire Snohomish river basin. These two thus account for only 3000 natural origin spawners for 1998.

The HGMP simply fails to comment on the nature of the scant data provided and fails to discuss the implications of the data provided for understanding the current condition of the listed populations that may be affected by the release of juveniles from the hatchery. These failures are further disconcerting in view of the acknowledgement on page 9 that "[n]ew information indicates that there are substantial numbers of hatchery fish spawning in the wild…"

The third bulleted element of this subsection of the HGMP template includes a direction to "include estimates of juvenile habitat seeding relative to capacity or natural fish densities, if available." This direction is not addressed by the HGMP in question. As noted previously, it is essential that an accurate depiction of the scale of the hatchery releases relative to the production and capacity of listed fish in the basin be provided by each HGMP. A basic part of providing this scale is to estimate annual production of listed juveniles and to estimate the carrying capacity of the basin. The failure to do so is another significant shortcoming of this HGMP.

Subsection 2.2.3. Hatchery activities that may lead to take, associated monitoring and evaluation, and estimated annual level of take.

The response states, in part, that "[j]uvenile releases may cause unknown predation or competition risk to listed fish." The projected annual take levels are similarly described as simply "unknown". The associated take table (Table 1) at the end of the HGMP (page 26) lists Unintentional lethal take of egg-fry, juvenile/smolt, and adults as "unknown".

No attempt is made to estimate the level of this suspected take, yet this is what is explicitly requested by NMFS in the HGMP Template and in the HGMP Completion Guidelines dated January 5, 2000. Guideline G is especially relevant:

Under the broad definition of ESA, "take", of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. When "take" of a listed species is expected in the hatchery operation, the ESA **requires** that a numerical estimate be quantified as best as possible. (emphasis added)

Merely listing "unknown" fails to qualify as providing a numerical estimate as best as possible.

Clearly, in the absence of case-specific data and adequate research there is considerable uncertainty to estimates of levels of take resulting from the factors enumerated under guideline G. However, this uncertainty neither excuses the HGMP from making a credible attempt to estimate take levels as required by NMFS, nor does the presence of uncertainty itself render it impossible for credible estimates to be

made. The information and techniques available to undertake to provide such estimates may not reside within the staff at the hatchery facility or program level. But WDFW does have staff knowledgeable and practiced in risk assessment. We believe that such staff must be more directly engaged in these aspects of completing HGMPs.

Subsection 2.2.3 asks the respondent to "[I]ndicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program." No answer whatever is provided in response.

This is both unsatisfactory and disturbing. Critical to successfully pursuing the program goal of minimizing adverse impacts on listed fish is the existence of clear measurable quantitative impact-containment objectives (performance standards and indicators) and a monitoring program committed to collecting and analyzing the requisite data. An inevitable feature of a *bone fide* impact monitoring and evaluation program is a set of contingency plans for responding to the exceedence of threshold levels of impact.

We recommend that the Department develop quantifiable impact-containment objectives related to risk of take of listed juveniles by hatchery operations due to behavioral modification, competition, and predation, among other elements listed in Guideline G. In addition, we recommend that the Department assign a team consisting of individuals with experience in risk assessment and in wild stock research to work with individual hatchery managers in developing impact containment objectives, associated monitoring and research plans, and program responses to monitoring data that indicates that impact thresholds have been exceeded or are likely to be exceeded.

We believe that it is not possible to approve any HGMP that presently lacks such a risk-based impact-containment program.

Section 3. Relationship of Program to Other Management Objectives.

In general the answers provided in this section of the HGMP are cursory and insufficiently detailed.

Subsection 3.1. **Describe alignment of the hatchery program with any ESU-wide hatchery plan.**

The HGMP fails to address the relation of planned program releases to the co-managers' Future Brood Document, yet this appears to be the principal document governing production levels and coordination of production levels and releases between WDFW hatchery facilities and tribal facilities. The relationship between production levels proposed in the Future Brood Document and risk to ESA-listed salmonid species in Puget Sound should be addressed in this subsection. As previously noted, we believe that the magnitude of juvenile releases from each hatchery facility needs to be compared to local, within-basin, rearing capacity of listed juveniles as well as to the total number of hatchery juvenile releases planned for the whole of Puget Sound and Hood Canal.

It does not seem possible to adequately describe or characterize either the magnitude of a particular juvenile chinook program or its relationship to other management objectives without providing a sense of the scale of the proposed hatchery releases relative to the total planned production of hatchery juveniles in Puget Sound and Hood Canal and relative to the estimated numbers of listed juveniles within river basins and within the estuary and nearshore environments of Puget Sound and Hood Canal. This is a serious shortcoming of the HGMP in question.

Similarly, hatchery production level objectives contained in the Future Brood Document are directly related to both the harvest component and the hatchery component of the Co-Managers' Joint Resource Management Plan for Puget Sound Chinook (RMP), which are intended to obtain ESA 4(d) Take protection under Take Limit 6. The Wallace fingerling HGMP is, in fact, essentially an attachment to the hatchery RMP. The relationship of proposed production levels and methods contained in this HGMP to these governing planning documents clearly requires to be discussed in this section of the HGMP.

Subsection 3.2.

The response states that "[p]roduction numbers and appropriate stocks to be used are also outlined in a Memorandum of Understanding (MOU) between the [Tulalip] tribe and WDFW (WDFW, 1997)." The MOU in question should be attached as an appendix to the HGMP. As noted under 3.1 above, the Future Brood Document and the two RMPs would appear to be directly relevant here as well, and are not mentioned.

Subsection 3.3. Relationship to harvest objectives.

Subsection 3.3.1 of the HGMP template requests a description of "fisheries benefiting from the program" as well as "harvest levels and rates for program-origin fish for the last twelve years (1988-1999), if available." In response, it is asserted that program fish contribute to marine sport, commercial, and Tribal fisheries and an in-river sport fishery. This response is far too cursory.

In the context of the ESA and the listing status of Puget Sound chinook, it is the alleged benefits to fisheries of program releases that are being weighed against the myriad of risks to listed fish of hatchery operations. This is especially true in the case of isolated harvest programs such as the Wallace fingerling summer chinook program.

The HGMP template specifically requests data and detail to quantify an assertion that any particular hatchery program is providing such benefits. It is particularly important for an HGMP to note when data are lacking or inadequate to permit a reliable estimate to be made of the quantitative contribution of program fish to the fisheries that program releases are being targeted to benefit. When this is the case it would, further, seem necessary and appropriate for the HGMP to explain how the program proposes to address the problem of lack of data.

The cursory and inadequate response gives the impression that program managers believe either that it is obvious that the hatchery program provides fishery benefits that outweigh risks to listed stocks or the appropriate default presumption is that a hatchery program provides such benefits until proven otherwise. In the context of the ESA this is decidedly not the appropriate presumption. To the contrary, the HGMP process and NMFS would appear to be requesting that quantitative evidence be provided of the fishery benefits actually provided by a particular hatchery program. The HGMP patently fails to provide this evidence.

Further, the response fails completely to address the guidance in the HGMP Template that directs the applicant to explain how or if artificial production and harvest management have been integrated.

Subsection 3.4. Relationship to habitat protection and recovery strategies.

The HGMP provides no response. The HGMP Template provides the following guidance: "Describe the major factors affecting natural production (if known). Describe any habitat protection efforts, and expected natural production benefits over the short- and long-term."

This subsection clearly is requesting an estimation of freshwater and estuary juvenile rearing capacity and current wild, listed, juvenile production. It is also asking for a description of major limiting factors to natural production and capacity as well as for local and regional efforts to redress limiting factors. In addition, it is requesting that an assessment of the efficacy of such efforts be made.

All of these are relevant to characterizing the scale of hatchery releases and to assessing the relationship of these releases to the recovery of the listed species. As we have repeatedly noted in these comments, the minimal starting point for such an assessment is an estimate of current juvenile production and capacity of the basin.

At least one objective of this subsection is to weigh the appropriateness of the hatchery program against the current and expected natural productivity of the affected watershed. How badly is this harvest augmentation program needed? Is the listed population capable of accommodating the biological risks

imposed by the program? How long might it be necessary to tolerate those risks? Omitting this information from the HGMP leaves these and other important questions unanswered.

With regards to habitat protection efforts, the Snohomish River Basin is the focus of a number of habitat assessment, restoration, and protection initiatives in which WDFW staff have been regularly involved. This is a data-rich basin with respect to all of these matters. We can think of no good reason for this subsection having been left blank in this regard.

Subsection 3.5. Ecological interactions.

The response references "WDFW Risk Assessment, 2000" in regards to risks to listed juveniles from predation and competition by hatchery juveniles. Predation risks are considered to be "low" and risks of competition "high". These terms are uninformative in the absence of further explanation. The "WDFW Risk Assessment, 2000" should be attached to the HGMP as an appendix.

Further, merely noting that a risk is "low" or "high" does not suffice to determine whether or not the risk is acceptable or unacceptable. In the context of ESA and Section 4(d) take issues, what is relevant is whether or not the level of risk rises to that of take. It is obvious that neither the public nor NMFS can determine this from the simple response provided. This response is clearly inadequate.

Section 4. Water Source.

Subsection 4.1. Provide a quantitative and narrative description of the water source … water quality profile, and natural limitations to production attributable to the water source.

The response states that the “facility is covered under NPDES permit # WAG 133006.” This response is woefully incomplete, in view of the fact that the NPDES permitting process only requires Total Suspended Solids and Turbidity levels to be explicitly addressed. There are a host of water quality and quantity parameters that can be impacted by hatchery facility location and operations and that need to be addressed at this point by the HGMP.

Moreover, again the HGMP simply ignores the basic issue of describing the water source and water quality profile as requested in the Template. The HGMP should describe the basic physical, chemical, and biological parameters that affect water quality that are regularly measured at the facility and in the receiving stream upstream of the hatchery facility and immediately downstream of hatchery discharge points. The frequency with which such measurements are made and the hatchery activities associated with such measurements (such as the disinfection of holding ponds) should be described. The HGMP should explain the reasons as to why any basic water quality or quantity parameter is not regularly measured.

In addition, the results of water quality inspections, including violations under the terms of the NPDES permit, should be described and explained. If the facility has received no citations for water quality violations this should be reported as well. It should also be reported if no inspections for compliance with the NPDES permit have ever been made.

Subsection 4.2, Indicate risk aversion measures that will be applied to minimize the likelihood for the take of listed natural fish as a result of hatchery water withdrawal, screening, or effluent discharge.

The response merely addresses facility water intake screens, and in regard to the screen on the May Creek intake only states that the screen “is believed to be compliant.” At a minimum, quantitative evidence in support of this belief should be described/cited.

The response simply fails to address effluent discharge, as requested in the HGMP Template. Relevant issues regarding effluent discharge that should be addressed in this subsection include the following

stream temperature upstream of the hatchery facility and intake, stream temperature at the points at which the facility discharges water and/or effluent to the receiving stream and at a point immediately downstream of identified and permitted mixing zones. Such mixing zones should be explicitly identified and described.
Times at which temperature, physical qualities such as turbidity, and chemicals and water chemistry parameters such as disinfectants, antibiotics, and nitrates levels in receiving waters are measured should be described. In particular, discharges associated with regular hatchery activities such as cleaning of holding ponds should be described and the kinds of measurements taken and the times which they are taken should be described.

Risk avoidance and containment measures associated with all identified discharges and water quality parameters monitored should be described in detail as well. Reasons should be given for not monitoring any such reasonable measure of water quality in receiving waters. The response is inadequate in all of these respects.

Section 6. Broodstock Origin and Identity.

Subsection 6.2.3. Past and proposed level of natural fish in broodstock.

The HGMP states "Past levels of natural broodstock in the hatchery population are unknown. WDFW shall investigate the feasibility of incorporating summer Chinook returning to Sunset Falls into the hatchery broodstock. The Sunset Falls fish making up to 10% of the broodstock." Not only should the feasibility of doing this be investigated. The reasons for considering this measure should be stated and the *advisability* of doing so should be discussed. This measure raises important issues of mining listed spawners in a basin whose wild Chinook escapement is admitted to have been seriously compromised by hatchery straying for well over a decade (based upon the data reported in section 2.2.2 noted above).

Presumably this measure is being considered out of concern over domestication selection and/or inbreeding depression of the hatchery broodstock. Such issues should be explicitly noted and discussed in the HGMP. Again, if risks to the listed population are acknowledged in connection with this measure, alternatives measures with less potential risk to the listed population need to be considered in Section 1.16.

Section 7. Broodstock Collection

Subsection 7.2. Collection or sampling design.

The HGMP states on page 14 that beginning in 2004 "only marked adult fish volunteering to the Wallace River Trap will be used to meet hatchery requirements/ Unmarked fish *or marked fish in excess of hatchery needs* will be returned to the river to spawn naturally (emphasis added)." This raises several concerns. First, in view of the admitted and undesirable high level of straying within the Snohomish River Basin and particularly within the Skykomish River subbsasin in which the Wallace hatchery is located, the deliberate return of marked hatchery-origin adults to the river to spawn naturally is not only ill-considered, but appears to rise to the level of take itself. At a minimum, NMFS would appear to require that a quantitative estimate be made of the numbers of such hatchery-origin spawners that would be spawning naturally as a result of this particular practice and the numbers of listed spawners that these hatchery fish would likely encounter on the spawning grounds and the numbers that they would likely end up spawning with. Again, alternatives to this practice require to be explicitly considered, described, and discussed under section 1.16.

Second, this appears to directly contradict the statement in subsection 6.2.3 discussed above of incorporating 10% natural-origin fish from Sunset Falls into the annual hatchery broodstock.

Section 9. Incubation and Rearing.

Subsection 9.2.1 Survival data by hatchery life stage.

Average program performance data is requested. No response is provided and no explanation for the absence of a response is provided.

Subsection 9.2.4 Fish growth information.

The HGMP Template requests information regarding *average program performance*, including "length, weight, and condition factor data collected during rearing." (emphasis in the original). In response, the HGMP merely states the frequency with which "sampling" (unqualified) occurs in relation to fish size measured in numbers per pound. This is clearly inadequate. It does not provide quantitative details on average performance of the requested variables.

Subsection 9.2.10. Risk aversion measures to minimize the likelihood of adverse genetic and ecological effects on listed fish.

The HGMP Template indicates that information regarding risks of domestication as well as competition and predation is requested. The HGMP provides no response and no explanation for the absence of a response.

This is a serious omission. It is difficult to understand how NMFS could possibly consider granting an exemption from the 4(d) take prohibition to a hatchery facility or program that cannot articulate the manner by which it proposes to conduct its program so as to assure a high probability of keeping adverse impacts to listed stocks below an acceptable minimum.

A minimally adequate response to this subsection would include a list of hatchery rearing and release practices that are intended to keep potential adverse impacts below a threshold level, a statement of the threshold level(s) and a list of measurable performance indicators relevant to the estimation of adverse impacts, and a statement of the monitoring plan that will be employed to measure the indicators in a timely manner and a statement of management actions that will be taken should monitoring indicate that threshold levels of impact have been attained. We suggest that such details be developed and provided.

Section 10. Release.

It is stated that the program goal is to release 1,000,000 fish at 70 to the pound. "A coefficient of variance of 8 or less is desired". This latter must be in error; perhaps 8**%** is intended or **standard deviation** in fish-per-pound which would be equivalent to a coefficient of variation of 8/70 or 11.4%. This should be corrected.

In addition, numbers of fish per pound is an insufficient quantity to report with regard to assessing potential deleterious impacts on listed fish. The mean and distribution of condition factor (Fulton's K) and length should be reported in addition to numbers per pound.

Subsection 10.4.

It is stated that the June timing of fingerling releases is intended to "reduce interactions with wild fish." The matter of empirical evidence and related supporting reasons for this assumption should be addressed here as well. It needs to be transparent to reviewers whether this assertion is based upon or supported by basin-specific evidence or not; and if not, on what basis the assertion/assumption is being made.

As noted in comments on the response to SS 1.8, NMFS guidance directs applicants to provide citation and documentation to support critical information provided in the HGMP. No report or other documentation is provided to support the assertion that releasing fingerlings in June from Wallace River will “reduce interactions with wild fish” below any acceptable level. This is particularly distressing given the admission in SS 1.10 (p.5) that the emigration timing of wild chinook juveniles is “unknown.”

The expected numbers of migrating and rearing wild juveniles needs to be reported together with their size distributions and the temporal distribution of wild outmigration in order to provide a more complete picture of the potential for negative interactions between released hatchery and wild juveniles to occur. All such features are relevant to an assessment of the potential for interactions of several kinds to occur between groups of fish. These features need to be addressed and related to a credible estimate of the potential level of take of listed fish that is likely to result from the proposed releases. The response provided by the HGMP is inadequate.

Subsection 10.11. Risk aversion measures.

The response provided in the HGMP is merely a reiteration of the response provided under subsection 10.4. For the reasons stated in regards to that response the response in this subsection is inadequate for the estimation of the risk of take of listed fish that will result from the proposed releases. Again, no citation or documentation is offered to support the critical assertion made in this response.

Section 11. Monitoring and Evaluation of Performance Indicators.

Subsection 11.1. M & E of performance indicators presented in Section 1.10.

As discussed in relation to sections 1.9 and 1.10 there are no *bone fide* performance standards and indicators described in the HGMP around which a clear monitoring and evaluation plan could be structured. The response in this subsection is restricted to asserting that production groups of released hatchery fish will bear one or more of several kinds of marks that will enable them to be identified in fisheries and on the spawning grounds.

At best this marking will create a *potentia*l for monitoring impacts of hatchery fish on wild fish, particularly in regards to straying onto the spawning grounds of natural origin fish. A monitoring and evaluation plan, however, should set impact-containment objectives for the measurement of which specific marks are relevant. Specific ranges or levels of impact of concern need to be explicitly stated (as quantitative performance standards), the means and manner by which such levels will be estimated identified using measurable quantities (performance indicators) and a range of management responses to various measured levels of each indicator identified. In brief, no monitoring plan has been identified and described, and no standards have been specified against which the results of monitoring could be *evaluated.*

11.1.2
This response refers to the August 2002 *Joint RMP for Puget Sound Chinook Salmon Hatcheries*. This is the only reference to the RMP found by this review in the HGMP, even though Section 3 of the HGMP Template specifically directs applicants to identify the relationship and alignment of the specific program to other ESU-wide management objectives or plans. The relationship and alignment of this hatchery program to the RMP needs to be described.

Subsection 11.2. Risk aversion measures that will be applied.

The response simply asserts without any subsequent explanation that monitoring and evaluation "will be undertaken in a manner which does not result in an unauthorized take of listed chinook." This is grossly inadequate. It is, furthermore, a considerable exaggeration based upon the lack of substantive performance standards, indicators, and impact targets in the preceding sections of the HGMP. Of course, it is first necessary that a monitoring and evaluation plan be in place and be described in sufficient detail before one is in position to assert that the activities directly associated with monitoring activities themselves will not cause take. As previously noted, no monitoring and evaluation of sufficient detail for this purpose has been evidenced for this program by the HGMP.

Conclusion

The HGMP simply provides no reason to believe that unacceptable levels of take of listed species will not occur as a result of hatchery operations proposed and described herein. The HGMP quite simply commits to NO readily identifiable, measurable performance standards or indicators whatsoever. Nor does it identify alternative management actions that will or might be undertaken in light of the evaluation of the results of a clear quantitative monitoring program.

The intent of the HGMP Template and process would appear to be to evaluate several broad factors -- among which are: the justification for a particular hatchery program; the current state of the affected listed population; the potential for the program to take listed species, including a credible quantitative estimate of the level of the potential take, and the measures proposed by the program proponents to minimize that take (including a credible quantitative estimate of the expected extent of the resulting reduction in potential take and the ongoing monitoring and evaluation of those measures) -- and to weigh these factors against each other in order to determine if take authorization is warranted. In general, the responses provided to individual queries in the Template are cursory, lacking in sufficient detail, and often simply inappropriate.

The justification for the program is at best inadequately described. In Table 1, attached to the HGMP application, the level of unintentional take at all three life stages is listed as simply “unknown,” despite NMFS guidance requiring applicants to provide a “numerical estimate” of expected take levels. Measures to minimize take are either inadequately described or based on assertions left unsupported by any documentation. Likewise, the description of proposed methods for monitoring and evaluating those measures are unacceptably vague, at best.

Given these significant shortcomings, this review finds it nearly impossible to even evaluate the particulars of the proposed program. We find the application itself apparently inadequate to justify take authorization under the criteria enumerated in the 4d Rule. We are compelled to suggest that WDFW withdraw the application and redraft it, if it can provide the necessary information. If the necessary information is unavailable at this time, we suggest that WDFW reconsider the program, either discontinuing it or significantly scaling it back until it can provide pertinent information adequate to warrant take authorization.

7/18/03

I have recently had an opportunity to examine the Marblemount Winter Steelhead Program HGMP. As an angler and one-time natural resources officer, I have a concern for the health of native fish populations and, therefore, the condition of the wild chinook stocks in the Skagit River are important to me. So, too, are the wild winter steelhead in the Skagit which, as you know, have had seriously declining numbers over the past four years.

I should have liked to review all of the HGMPs but am unable to do so. Therefore, please accept this letter as my official response to the Marblemount HGMP. My position on this issue is based on information that I have reviewed from Washington Trout, which appears to be based on good science For the record, those comments are attached, and I concur fully with them.

Please provide Jeff Koenings with a copy of this letter and the comments.

7/18/03

Dear Sir:

I appreciate this opportunity to comment on the HGMPs for Puget Sound Hatcheries.

I have visited Icy Creek in the Green River Gorge since 1982 and fished there for steelhead and chum since 1995. It's important that the Dept. redesign the gated shotgun culvert through which the Pautzke holding ponds return flow to Icy Creek. On different occasions I've witnessed kings, coho, and hatchery steelhead attempting to leap into the culvert.(Please see Coho below).

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The Kings can be especially relentless in their efforts. In addition since they usually return during low flow periods in October- the water provides little cushion and the salmon wound themselves striking the culvert as well as the walkway alongside it. Unquestionably the majority of the chinook attempting to "ascend" the culvert are hatchery fish but there are always a few unclipped fish in the mix. Therefore it may be that the Dept. in this instance is endangering a threatened species, Green River Summer Fall Chinook.

The HGMP suggests that the Dept. may build a trap at the mouth of Icy Creek to capture returning chinook. Such a facility must be designed in a way that will limit impacts on coho and chum which ascend as far upstream as the diversion dam to spawn once the creek is recharged by winter rains.

Finally, I feel that it is important that the Dept. does a better job of preventing the incidental take of waterfowl such as herons, ducks, and kingfishers due to fish rearing operations. Last Winter at least two Great Blue Herons died after becoming entangled in netting enclosing the holding ponds. In addition, I watched a mink catch and kill a hooded merganser, a bird that under natural conditions a mink would have little chance of catching.

Thank you for your time.

7/18/03

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Please provide Jeff Koenings with a copy of this letter and the comments.

7/18/03

Dear Dr. Koenings,

Like most citizens, I do not have the resources to examine every HGMP for hatcheries in the state of Washington.

I do know from being a former assistant to Gov. Mike Lowry and from having engaged myself in political action about hatcheries over the past 15 years that the state still assumes that having hatcheries to provide placebo fish is a good thing, an assumption that science shows to be untrue. As you know, and as hatchery managers know, each hatchery supplying placebos for commercial and sports catches exists a political installation based on the past's ignorance and the present's tolerance of ignorance.

Put simply, hatcheries, no matter the foofalaw about run timing, kill off runs of wild, superior fish, and can exist only because WDFW and like agencies refuse to state this plain truth plainly to anglers and the politicians who service them. I grant that only the brave would dare to try to convince the Legislature and governor that hatcheries should be shut down.

As Skagit River Coordinator for the Steelhead Committee of the Federation of Fly Fishers, I have decided to adopt the comments below of Washington Trout as my comments on the Marblemount facility.

Draft Comments on Marblemount Winter Steelhead Program HGMP
July 16, 2003

Sections 1.7 and 1.8. Program Purpose and Justification.

This is a significant steelhead yearling smolt production program releasing 334,000 fingerling smolts from a combination of on station and offstation acclimation/release sites. (Sections 1.10 Table, page 3 and Section 1.5, page 2).

The program is characterized as an augmentation program whose purpose is to provide steelhead "for sport and tribal harvest opportunity." In addition, section 1.8 implies that "minimizing adverse effects on listed fish" is also a second (an apparently secondary) program goal. This goal needs to be clearly stated and explained in appropriate detail in this section, essentially at the beginning of the HGMP.

As in the case of all other chinook and coho HGMPs that we have reviewed, Section 1.8 fails to provide any justification for the general program purpose (harvest augmentation) or for this particular steelhead production program. Rather, it merely states some features of the rearing and release of hatchery fish. No motivation is provided in regard to the following implicit fundamental questions: Why is harvest augmentation an appropriate or valid goal? Why does it need to occur at the Marblemount facility or even within the Skagit River Basin? Why is it socially, economically, or biologically necessary, advisable, or even beneficial to provide fish for harvest using this program at this facility? Perhaps WDFW takes it for granted that providing fish for harvest is justification in itself, but NMFS should not have to when evaluating this program, nor, certainly, should the public.

There likely are several and varied justifications for providing fish for harvest. They should be listed and described in sufficient detail to be evaluated and weighed objectively against all direct and indirect take of listed species likely to occur as a result of the program.

Further, taking for granted some general need for "fish for harvest" provides no kind of justification for any particular program. Presumably, "fish for harvest" can be provided in any number of ways at any number of places. This is particularly true in the case of steelhead which are not a (non-tribal) commercial fish. Wild steelhead are capable of providing a significant non-tribal sport fishery under catch-and-release management,

and the Skagit in particular has a viable, though recently declining, wild steelhead population that can serve this purpose, one moreover that itself may be harmfully impacted by the hatchery program in question. This response should describe why it is necessary to produce steelhead smolts for harvest in the Skagit River basin under the specific protocols proposed - again, in order that such justification can be weighed against the risk of potential take that may occur, relative to other options, including discontinuing or scaling back the program. In addition the risk to the native steelhead population in the Skagit basin needs also to be weighed against alleged program benefits. Presumably, relative to take authorization, the standard of justification for a steelhead harvest augmentation program should be higher than for a chinook recovery, preservation/conservation, or research program, or at least different. One should expect at best a very low level of biological "benefit" from a harvest/augmentation program. Therefore, a relatively high level of social and/or economic "benefit" should be described in detail in order to justify any biological risks of the program to listed Puget Sound chinook (and to indigenous wild steelhead).

Such benefits should be summarized here and described in greater detail in section 3.3.1. Unfortunately the response in section 3.3.1 consists of a single non-sentence stating "Skagit River and north Puget Sound saltwater (mainly west Whidbey Island) recreational and tribal commercial net fishery" (page 11).

WDFW appears to assume one or both of two things: that because the existing Marblemount Winter Steelhead Program predates the listing of Puget Sound Chinook, the "benefit" of raising fish for harvest at Marblemount has already been established, and should not require detailed explication; or that the assertion that the existing program will be run (or has been run) in order to "minimize adverse effects on listed fish" is adequate to justify continuing the program. To be fair, guidance offered by NMFS in the HGMP template could be interpreted to imply as much. Nevertheless, Washington Trout considers both of these assumptions counterintuitive, and a misreading of both the spirit and the specific requirements of the 4d Rule and the HGMP template.

At any rate, the response for this subsection of the HGMP lacks detail sufficient to assure that the program will result in "adverse effects on listed fish" being contained within quantifiable limits that can reasonably be considered to be "safe." The mere assertion that the Department's intention is to provide fish for harvest "while minimizing adverse Effects on listed fish" is insufficient.

Washington Trout believes that quantitative standards that provide clear threshold levels of potential adverse impact to be avoided need to be stated and then clearly linked to quantitative monitoring variables and monitoring plans containing detailed timelines for achieving biologically appropriate performance standards.

Sections 1.9 and 1.10. Performance standards and indicators.

Performance standards and indicators and associated Monitoring and Evaluation plans are listed in the Table on pages 3 - 5 titled "Performance Standards and Indicators for Puget Sound Isolated Harvest Steelhead programs". As we have discussed in some detail in our comments on the Fingerling Chinook program HGMPs, these fail to be stated as quantifiable measures and they lack any explanation or justification demonstrating their suitability for the task that they are intended to serve.

For example, page states as a Performance Standard "minimize interactions with listed fish through proper rearing and release strategies". This is not a performance standards but more a re-statement of a program goal. A standard would specify a quantifiable, numerical metric that pertains biologically to one or more of the kinds of adverse impact that the rearing and/or release of yearling steelhead smolts can have on listed fish.

Be this as it may, none of the items listed under the heading Performance Indicator corresponding to the purported standard is clearly stated as an indicator nor is any one of them obviously relevant to the goal (not a standard) of minimizing adverse interactions with listed fish. A modicum of biologically relevant argumentation is required to make a case for the relevance of these items, and such argument is not made in this HGMP been made.

The remarks under the heading Monitoring and Evaluation Plan corresponding to this standard ("Minimize interactions with listed fish through proper rearing and release strategies") contain no measurable criteria and no actions associated with attempts to measure impacts of hatchery releases on listed juveniles. Nor do they contain or reference any timeline for changing program actions so as to endeavor to come into compliance with a bone fide standard.

The performance indicators listed are "[j]uveniles released as smolts"; "[outmigration timing of listed fish/hatchery fish - early May (chinook)/May(steelhead)"; "[s]ize and time of release - 6 fpp/ May 1-15 release and, "[h]atchery stray rates". These are closer to being standards than they are to being measures that can serve to indicate whether or not a standard is attained.

Only the number and size of release contain measurable quantities. Most importantly, no explanation is provided that explains how such measurements (or potential measurements) are biologically relevant to the goal (not standard) of minimizing interactions with listed fish. No discussion occurs anywhere in the HGMP to describe how such putative indicators have been or will be employed in guiding and modifying program activities. No detailed monitoring plan employing such indicators and adhering to a biologically relevant timeline is described.

The associated Performance indicator of 6 fpp raises another important issue for this and all HGMPs. Fish-per-pound is hatchery management jargon and not clearly understood by the public. Moreover, where length is of direct relevance to issues such as predation and competitive interactions between yearling steelhead smolts and chinook juveniles, number per pound cannot be directly translated into length or weight without specification of the condition factor of the released fish. We therefore recommend, first of all, that the Fulton condition factor, K (=W(grams)*100/(L(cm)^3) be reported together with both the number of fish per pound and the length in centimeters or millimeters that is associated with the number per pound at the given condition factor. Second of all, we recommend that the distribution of condition factor, length, and numbers per pound be provided for all hatchery releases discussed in the HGMP. Information about the size range of released hatchery juveniles in conjunction with the size distribution of rearing and migrating listed juveniles is critical in estimating the likely adverse impacts of hatchery releases.

In brief, these two sections (1.9 and 1.10) fail to comply with the HGMP

Template and NMFS guidelines for completing the Template.

Subsection 1.16. Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

The response to the HGMP is "None". This is clearly unacceptable and fails to comply with NMFS HGMP Template and guidance. It is incumbent on the HGMP to list and discuss reasonable alternatives to the proposed program that may better satisfy one or more of the program goals, particularly the presumably over-arching goal of eliminating or minimizing adverse impacts on listed fish! In the present case, WDFW has the additional concern pursuant to the Wild Salmonid Policy of considering and avoiding adverse impacts on the Skagit wild winter steelhead population.

Clearly, one possible alternative is to considerably reduce the size of the releases. 334,000 fingerling smolts are proposed to be released and 534,000 is implied to be the co-managers' goal (Section 1.12, page 6). Another option would be to develop a recovery plan for wild winter steelhead which have recently failed to achieve WDFW's escapement goal. Instead, WDFW is considering simply reducing the escapement goal. A re-direction of agency focus toward wild steelhead recovery in compliance with WDFW's own Wild Salmonid Policy with funding savings from reducing the hatchery steelhead program being invested in wild steelhead recovery measures in the Skagit River basin is certainly worth considering and evaluating at this point in the HGMP. This failure appears to us to be a serious deficiency of this HGMP.

Section 2. Effects on Listed Salmonid Populations.

Section 2.2.3. Hatchery activities that may lead to take. The response states, in part, that "release of fish described in this HGMP could potentially result in ecological interactions with listed species.

The potential ecological interactions are discussed in Section 3.5, and risk control measures are discussed in Section 10.11" (page 9). The HGMP template requests that "annual take levels for listed fish by life stage" be provided. The HGMP refers readers to associated take table (Table 1) at the end of the HGMP (page 34) where the unintentional lethal take of juvenile/smolt is listed simply as "unknown".

No attempt is made to estimate the level of this suspected take, yet this is what is explicitly requested by NMFS in the HGMP Template and in the HGMP Completion Guidelines dated January 5, 2000. Guideline G is especially relevant:

Under the broad definition of ESA, "take", of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. When "take" of a listed species is expected in the hatchery operation, the ESA requires that a numerical estimate be quantified as best as possible. (emphasis added) Merely listing "unknown" fails to qualify as providing a numerical estimate as best as possible.

Subsection 3.3. Relationship to harvest objectives.

Subsection 3.3.1 of the HGMP template requests a description of "fisheries benefiting from the program" as well as "harvest levels and rates for program-origin fish for the last twelve years (1988-1999), if available." In response the HGMP merely lists "Skagit River and north Puget Sound saltwater (mainly west Whidbey Island) recreational and tribal commercial net fishery". This response is far too cursory.

In the context of the ESA and the listing status of Puget Sound chinook, it is the alleged benefits to fisheries of program releases that are being weighed against the myriad of risks to listed fish of hatchery operations. This is especially true in the case of isolated harvest programs such as the Marblemount Winter Steelhead program. The HGMP template specifically requests data and detail to quantify an assertion that any particular hatchery program is providing such benefits.

In particular, numbers caught by particular fisheries are not provided, nor is any economic data related to catch or fishing effort reported. Yet such data is fundamental to quantifying and evaluating the benefit to fisheries that it is alleged is the principal purpose and justification for the program. It is difficult for us to understand how NMFS can possibly approve an HGMP such as this that does not even attempt to muster the barest of evidence necessary to support the claim that the program produces benefits. At a minimum these must be characterized and then evaluated against the considerable risks to which yearling steelhead smolt programs subject listed chinook.

Economic data is particularly relevant in the present case in view of the statement in section 1.12 of the HGMP (page 6) that the "tribal goal for hatchery winter steelhead is to harvest 5000 adults commercially. This goal is not being achieved. The non-tribal goals are to have a self-sustaining hatchery run of 400 adults. This equates to a ~1% return on total smolt releases into the watershed (534,000 smolts)." The tribal fishing effort required to harvest 5000 adult hatchery steelhead clearly depends upon the price tribal fishers might receive for steelhead. Based upon testimony by Skagit tribal biologist Robert Hayman during Washington Trout's litigation of WDFW in 1997 concerning the proposed building of a steelhead hatchery facility at Grandy Creek that proposed to achieve this same release level of 534,000 smolts, since the mid-1990s the price of tribally-caught steelhead has been too low to justify the effort required to harvest 5000 adults. We are unaware that this situation has changed significantly since then. It is clearly incumbent on WDFW in this HGMP to discuss such issues.

It is also important for an HGMP to note when data are lacking or inadequate to permit a reliable estimate to be made of the quantitative contribution of program fish to the fisheries that program releases are being targeted to benefit. When this is the case it would, further, seem necessary and appropriate for the HGMP to explain how the program proposes to address the problem of lack of data.

The cursory and inadequate response gives the impression that program managers believe either that it is obvious that the hatchery program provides fishery benefits that outweigh risks to listed stocks or the appropriate default presumption is that a hatchery program provides such benefits until proven otherwise. In the context of the ESA this is decidedly not the appropriate presumption. To the contrary, the HGMP process and NMFS would appear to be requesting that quantitative evidence be provided of the fishery benefits actually provided by a particular hatchery program. The HGMP patently fails to provide this evidence.

Further, the response fails completely to address the guidance in the HGMP Template that directs the applicant to explain how or if artificial production and harvest management have been integrated.

Section 3.5. Ecological interactions.
Compared to the chinook HGMPs, the Coho and Steelhead HGMPs endeavor to more completely discuss issues related to nutrient enhancement, competition, and predation. Despite the additional discussion the HGMP fails to adequately acknowledge the likelihood of risk to listed chinook from releases of yearling steelhead smolts and reflects several erroneous assumptions regarding juveniles chinook rearing and migration that are common to the chinook HGMPs.

The HGMP continues to rely upon the erroneous and dated one-third body size rule of thumb. The recent peer-reviewed published study by Pearsons and Fritts (1999) that demonstrates that coho fingerling smolts are capable of successfully preying upon and consuming juvenile chinook 46% of their own body length is mentioned and then ignored without any discussion. This is despite the fact that WDFW's own Salmonid Stock Conservation Science Unit has been developing and refining a predation model for use in assessing hatchery-related risks of just the kind at issue in this HGMP that explicitly incorporates the 46% figure as the appropriate rule of thumb! In addition the HGMP fails to mention that in the same study Pearsons and Fritts documented fingerling coho smolts attacking and attempting to consume and killing as a result of the attempts juvenile chinook up to 58% of their body length.

The Pearsons and Fritts study also reported results of other studies that evaluated steelhead predation on fingerling chinook, but the HGMP simply refuses to mention this. The studies demonstrated the yearling steelhead smolts (which are significantly larger than coho fingerling smolts whose predation was also studies) preyed upon and consumed chinook fingerlings up to 44% of their body.

At 6 fish-per-pound and a condition factor of 1 (the general target K-factor for WDFW hatcheries), the average yearling steelhead smolt would be 196 millimeters long and would therefore be capable (using Pearsons and Fritts data) of consuming juvenile chinook 86 millimeters long. Even an exceptionally heavy smolt with a condition factor of 1.2 would be 185 millimeters long and capable of consuming chinook juveniles up to 81 millimeters long. These sizes are well above the range of average lengths of actively downstream migrating juvenile chinook in the Skagit river basin listed in Table 3.5.1 of the HGMP (page 13) even at statistical week 26, the last week in June.

During the time during and immediately following release (May 1 - 15) the average size of the largest, actively migrating, juvenile chinook caught in the lower Skagit trap is less than 60 millimeters! Even without the proper size distribution data needed to accurately assess the predation/competition risk releases of these smolts poses to listed chinook (see next paragraph) it is more than reasonably clear that fully 100% of listed juvenile chinook rearing and migrating in the Skagit (and present in the estuary in May and early June) are capable of being preyed upon and consumed by these steelhead smolts!

Moreover, the data provided in Table 3.5.1 do not fully or adequately reflect the risk of predation by released yearling steelhead smolts on listed chinook juveniles. This data is average size data only for chinook that are actively migrating downstream. These are the ones that are caught in the migrant traps!

Smaller fish still rearing and/or not actively migrating are still present along the migration corridor. In other words, the juvenile chinook sizes from traps reported in Table 3.5.1 at best provide an index of the maximum size of chinook present that might be subject to predation, displacement, and other kinds of competition.

For both the case of actively migrating juvenile chinook caught in migrant traps and the case of non-migrating juveniles size (length) distributions need to be considered and should be provided. Even if the shape of the size distribution is assumed to be normal, there will likely be a significant left-hand tail to the size distribution containing significant numbers of smaller fish. If, as is more likely, the distribution is not normal but skewed to the right, the mode of the size distribution will be somewhere to the left of the mean (average) size; in this case, the length interval containing the greatest number of individuals will be composed of fish smaller than the average size. In as much as the purpose of considering this kind of data is to attempt to quantify the potential level of take per paragraph "G" of NMFS HGMP guidance, these length distributions need to be estimated and appropriately risk-adverse estimates of the numbers of listed juvenile chinook of vulnerable sizes present along the migration corridor employed.

The HGMP appears to merely go through the motions of considering competition and predation of yearling steelhead smolts on listed juveniles. It relies upon assumptions such as the one-third length rule of thumb and misleading summary data (the average size data from the migrant traps) that minimize the potential predation and competition risks. In addition, in relying upon the one-third size rule the HGMP ignores recent research (conducted by its WDFW's own employees) that demonstrates that the one-third rule is inappropriate. After having done this, the HGMP still refuses to provide a numeric estimate of the potential level of take that is likely to result from the proposed releases. Even so, in the case of these large yearling steelhead smolts the capacity for predation on the majority of juvenile chinook present is considerable. This is still the case, if one were to rely upon the erroneous one-third body length rule to estimate predation capacity.

In the context of the ESA it seems clear to Washington Trout that when faced with genuine uncertainty as to a potential harmful effect of a hatchery practice -- resulting either from lack of data and lack of past research, or from uncertainty regarding biological mechanisms involved in potentially harmful inter- and intra-specific interactions – when estimating the potential level of the harmful impact assumptions ought to be employed that risk over-estimating the level of take, rather than risk under-estimating it! In other words, the estimation process ought to be more concerned with providing reasonably high power (low probability of making a Type II error) than with keeping the probability of making a Type I error low for a null hypothesis that hatchery releases cause no take. The HGMP is simply more concerned with wrongly estimating a level of take from predation by hatchery smolts than it is with failing to guard listed juvenile chinook against the credible risk of take from predation by hatchery smolts. As with most of the numerous factors responsible for the decline and listing of salmonid populations under the ESA, the listed resource is forced to bear the full burden of the uncertainty. This would appear to be patently illegal.

Section 6.1. Broodstock Source.

The HGMP states (page 19) that the hatchery adults collected for broodstock "are of locally adapted Chambers Creek origin and are segregated from the wild population genetically and temporally." No supporting data is provided or cited as required by NMFS. This is of particular concern in that WDFW's claim that Chambers Creek steelhead hatchery stock are "genetically and temporally" segregated from the wild population is controversial to say the least and unsupported. NMFS' own science center genetics staff among others have expressed concern over this claim of temporal isolation. Even some of WDFW's own genetics staff acknowledge unease and concern regarding this belief and its consequences for wild stock viability. In any case it requires to be supported with evidence.

In addition, the claim that the out-of-basin-origin broodstock is "locally adapted" is unsupported and, to say the least, controversial. Supporting evidence and discussion is clearly required. Section 10.11. Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.

The response merely asserts that to "minimize the risk of residualization and impact upon natural fish, hatchery yearlings are released in May as smolts and only in the Skagit River watershed. (page 26). This response is clearly inadequate for several reasons. It simply begs the question that "minimization" is tantamount to "reduction to a level below that which constitutes take". This requires to be explained and demonstrated! As discussed above in regard to section 3.5 there is evidence for considerable risk of competition and outright predation on listed juvenile chinook from the smolt releases at issue in this HGMP.

As is common in all other HGMPs we have reviewed this refusal to seriously endeavor to quantify the level of take is indicative of a cavalier attitude toward the HGMP process and towards the genuine risk that hatchery operations can pose to listed fish. We do not see how NMFS could approve HGMP that refuse to provide the modicum of detail necessary to characterize the risks that the HGMPs are intended to assist NMFS to evaluate and that simply appear to fail to even take the obligation to do so seriously.

Section 11.1. Monitoring and Evaluation of Performance Indicators.

This response in this and the following section is completely identical to the response provided in the HGMP for the Soos Creek Coho program. There is, in other words nothing that is specially crafted for the Skagit basin or that is intended to address the unique aspects of a yearling steelhead program. We are forced, therefore, to repeat our comments to that response.

The response consists principally of assertions that the co-managers intend to conduct some "ongoing monitor (sic!) programs, including catch, escapement, marking, tagging, and fish health testing" and statements of intentions to conduct future research on aspects of juvenile salmon ecology and research to assess the risks of predation on listed species by hatchery coho and steelhead. While this is surely well and good, it fails to address in detail the specific performance standards and indicators listed in section 1.9 and 1.10. Such an endeavor is surely hampered by the fact noted in our comments on those sections that no bone fide standards or indicators are provided.

What seems to be required here and is fundamentally missing is a detailed description of the kinds of monitoring currently going on or planned to occur in the immediate future with regard to specific quantitative standards and indicators, especially those pertaining to risk of harm to listed fish. Without a clear account of what kinds of things need to be measured and what the target levels of each is, it is impossible to understand what features or practices of the program could be changed in order to bring about compliance with target levels (standards). Without knowledge of what could be changed in order to bring about achievement of (compliance with) a standards neither NMFS not the public can attain a clear idea of what would be changed. Absent this, there simply are no standards.

The mere statement of the intention to monitor or conduct research without any substantive details is not in any way an equivalent or an acceptable substitute for a clear quantitative monitoring plan, which specifies both the kinds of program changes that will occur or will be evaluated in response to specific monitoring data and the period of time within which such changes will occur and quantitative threshold performance standards will be achieved. The HGMP provides no such detail. It effectively describes no monitoring plan and it has no timelines.

Section 11.2. Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.

The fundamental shortcomings noted under section 11.1 are further Evidenced by the response to this section, which consists entirely of the statement that "[r]isk aversion measures will be developed in conjunction with monitoring and evaluation plans" (page 26). In other words, there currently are no risk aversion measures because there currently appears to be no detailed monitoring and evaluation plan.

This is more than a little disturbing. It would seem to reveal that the implicit program goal suggested in section 1.8 of "minimizing adverse genetic, demographic or ecological effects on listed fish" is not an

operative goal or objective at all. The response clearly and simply suggests that there are no currently operative risk aversion standards regarding adverse impacts of hatchery practices on listed fish.

Risk aversion measures should be implicit in the specification of quantitative performance standards and indicators, if not explicit! If clear quantitative performance standards and indicators were provided in sections 1.9 and 1.10 as required by NMFS in the HGMP Template and associated Guidance, the appropriate risks to be avoided would be implicitly those required in order to attain the standards! Attainment of the standards, in turn, is evidenced by the attainment of specific levels in the indicators which figure directly in monitoring plans. The monitoring and evaluation plans would be structured by the very statement of quantitative standards and indicators. NMFS requires that these be articulated in section 1 of the HGMP.

That the HGMP can only state that monitoring and evaluation plans are Yet to be developed is incredulous. The clear statement with a modicum of detail of a monitoring and evaluation plan, including a description of program responses to failures to attain standards directed at avoiding risk to listed species is a bare minimum of an acceptable HGMP. We fail to understand how this HGMP could be approved by NMFS when it is so fundamentally incomplete in this regard.

07/25/2003

Re: Marblemount Winter Steelhead Program HGMP

Dear Director Koenings,

All species of Skagit River Salmonids are important to me. I have recreationally pursued these fish for almost fifty years. This letter is written to focus on the Marblemount Winter Steelhead Program. I have read the Washington Trout responses to the WDFW Hatchery Plan to which I basically concur. Their responses were obviously science-based and fit with my concerns.

My personal perspective is that we should not continually. increase hatchery releases of steelhead smolts throughout the upriver sections without improving and /or increasing habitat in their downriver migration. Hatchery capacity should not be the defining option for numbers of steelhead smolt release. Getting these smolts to the ocean and back must also be a priority.

I remember the huge returns during the 1960s when the Barnaby Slough facility was in its heyday. This semi or quasi natural rearing area gave the Skagit River a steelhead reputation that is still talked about. I do not know exactly why those runs diminished but the winter run today is barely a shadow of that time. Recent winter steelhead returns have been dropping even further as the hatchery smolt releases have increased. It just seems logical to me that the WDFW must develop a total winter steelhead program that addresses both hatchery management and river habitat.

Thank you for extending the time for public input and for reviewing my remarks. Our wonderful Wild and Scenic Skagit River deserves this major focus by management officials.

07/28/03

The Kendall creek hatchery operation is flawed because they have not developed a comprehensive genetics management plan that will preserve the South fork Spring chinook stock as well as the north fork fish. The releases from the coho facility on the south fork and the chinook releases from the Kendall facility are larger than can be justified by the co-managers for any chinook rebuilding effort. Wild fish are not replacing themselves and hatchery fish that spawn in the wild are or may be competing for space but are not able to produce future spawners at apparently any rate that would indicate program success. Future work should include a detailed analysis of CWT and other survival data to determine if hatchery fish with CWT are a good representive for the population. It would appear that the south fork stock of chinook should be extinct given the stray rates and 1999&2000 genetics reports. If these fish are gone what will change in your twisted HGMP.

Attachment on the following pages [WDFW note: Attachment never received]

07/18/03

I have examined the Marblemount Winter Steelhead Program HGMP. The Skagit River's wild Chinook, as part of listed Puget Sound Chinook, are important to me. So too are the wild winter steelhead in the Skagit which have crashed in numbers the past four years.

I do not have the time or resources to fully review all the HGMPs, so I have chosen the Marblemount HGMP as my choice for response from among the list on the Washington Department of Fish and Wildlife's WebPages with a solicitation for public responses through July 18, 2003 (deadline of 5:00 p.m.).

Because of my lack of time to fully research scientific sources to support my concerns, I used what Washington Trout was able to provide me in their own response to the Marblemount HGMP. It is obviously science-based and concurs with my Skagit River concerns. I have attached (or included) their remarks as if they were those of my own. Essentially I am using Washington Trout's response to the Marblemount HGMP as my sole scientific citing because it best fits as a defining reference to the problem.

I also haven't had a lot of time to go over the Snohomish system information either but I but what I have seen seems to indicate that harvest of hatchery fish and eventually of wild fish is called for. I would hope that this isn't true and that Wild steelhead would be put into a higher position and given a chance to thrive with limited hatchery involvement. I think that there is some room for both of them on systems like the Snohomish but right now the wild fish are taking a beating and there is enough habitat that it should be supporting greater wild steelhead production and if hatchery fish are hurting them at all we should cut back on them.

Attachment on the following pages.

Draft Comments on Marblemount Winter Steelhead Program HGMP
NG July 16, 2003

Sections 1.7 and 1.8. Program Purpose and Justification.

This is a significant steelhead yearling smolt production program releasing 334,000 fingerling smolts from a combination of on station and offstation acclimation/release sites. (Sections 1.10 Table, page 3 and Section 1.5, page 2).

The program is characterized as an augmentation program whose purpose is to provide steelhead "for sport and tribal harvest opportunity." In addition, section 1.8 implies that "minimizing adverse effects on listed fish" is also a second (an apparently secondary) program goal. This goal needs to be clearly stated and explained in appropriate detail in this section, essentially at the beginning of the HGMP.

As in the case of all other chinook and coho HGMPs that we have reviewed, Section 1.8 fails to provide any justification for the general program purpose (harvest augmentation) or for this particular steelhead production program. Rather, it merely states some features of the rearing and release of hatchery fish. No motivation is provided in regard to the following implicit fundamental questions: *Why is harvest augmentation an appropriate or valid goal? Why does it need to occur at the Marblemount facility or even within the Skagit River Basin?* Why is it socially, economically, or biologically necessary, advisable, or even beneficial to provide fish for harvest using this program at this facility? Perhaps WDFW takes it for granted that providing fish for harvest is justification in itself, but NMFS should not have to when evaluating this program, nor, certainly, should the public.

There likely are several and varied justifications for providing fish for harvest. They should be listed and described in sufficient detail to be evaluated and weighed objectively against all direct and indirect take of listed species likely to occur as a result of the program.

Further, taking for granted some general need for "fish for harvest" provides no kind of justification for any particular program. Presumably, "fish for harvest" can be provided in any number of ways at any number of places. This is particularly true in the case of steelhead which are not a (non-tribal) commercial fish. Wild steelhead are capable of providing a significant non-tribal sport fishery under catch-and-release management, and the Skagit in particular has a viable, though recently declining, wild steelhead population that can serve this purpose, one moreover that itself may be harmfully impacted by the hatchery program in question.

This response should describe why it is necessary to produce steelhead smolts for harvest in the Skagit River basin under the specific protocols proposed – again, in order that such justification can be *weighed against* the risk of potential take that may occur, relative to other options, including discontinuing or scaling back the program. In addition the risk to the native steelhead population in the Skagit basin needs also to be weighed against alleged program benefits.

Presumably, relative to take authorization, the standard of justification for a steelhead harvest augmentation program should be higher than for a chinook recovery, preservation/conservation, or research program, or at least different. One should expect at best a very low level of biological "benefit" from a harvest/augmentation program. Therefore, a relatively high level of social and/or economic "benefit" should be described in detail in order to justify any biological risks of the program to listed Puget Sound chinook (and to indigenous wild steelhead).

Such benefits should be summarized here and described in greater detail in section 3.3.1. Unfortunately the response in section 3.3.1 consists of a single non-sentence stating "Skagit River and north Puget Sound saltwater (mainly west Whidbey Island) recreational and tribal commercial net fishery" (page 11).

WDFW appears to assume one or both of two things: that because the existing Marblemount Winter Steelhead Program predates the listing of Puget Sound Chinook, the “benefit” of raising fish for harvest at Marblemount has already been established, and should not require detailed explication; or that the assertion that the existing program will be run (or has been run) in order to “minimize adverse… effects on listed fish” is adequate to justify continuing the program. To be fair, guidance offered by NMFS in the HGMP template could be interpreted to imply as much. Nevertheless, Washington Trout considers both of these assumptions counterintuitive, and a misreading of both the spirit and the specific requirements of the 4d Rule and the HGMP template.

At any rate, the response for this subsection of the HGMP lacks detail sufficient to assure that the program will result in "adverse effects on listed fish" being contained within quantifiable limits that can reasonably be considered to be "safe." The mere assertion that the Department's intention is to provide fish for harvest “while minimizing adverse effects on listed fish" is insufficient.

Washington Trout believes that quantitative standards that provide clear threshold levels of potential adverse impact to be avoided need to be stated and then clearly linked to quantitative monitoring variables and monitoring plans containing detailed timelines for achieving biologically appropriate performance standards.

Sections 1.9 and 1.10. Performance standards and indicators.

Performance standards and indicators and associated Monitoring and Evaluation plans are listed in the Table on pages 3 – 5 titled “Performance Standards and Indicators for Puget Sound Isolated Harvest Steelhead programs”. As we have discussed in some detail in our comments on the Fingerling Chinook program HGMPs, these fail to be stated as quantifiable measures and they lack any explanation or justification demonstrating their suitability for the task that they are intended to serve.

For example, page states as a Performance Standard “minimize interactions with listed fish through proper rearing and release strategies”. This is not a performance standards but more a re-statement of a program goal. A *standard* would specify a quantifiable, numerical metric that pertains biologically to one or more of the kinds of adverse impact that the rearing and/or release of yearling steelhead smolts can have on listed fish.

Be this as it may, none of the items listed under the heading Performance Indicator corresponding to the purported standard is clearly stated as an indicator nor is any one of them obviously relevant to the goal (not a standard) of minimizing adverse interactions with listed fish. A modicum of biologically relevant argumentation is required to make a case for the relevance of these items, and such argument is not made in this HGMP been made.

The remarks under the heading Monitoring and Evaluation Plan corresponding to this standard (“Minimize interactions with listed fish through proper rearing and release strategies") contain no measurable criteria and no actions associated with attempts to measure impacts of hatchery releases on listed juveniles. Nor do they contain or reference any timeline for changing program actions so as to endeavor to come into compliance with a *bone fide* standard.

The performance indicators listed are “[j]uveniles released as smolts”; “[o]utmigration timing of listed fish/hatchery fish – early May (chinook)/May(steelhead)”; “[s]ize and time of release – 6 fpp/ May 1-15 release and, “[h]atchery stray rates”. These are closer to being standards than they are to being measures that can serve to indicate whether or not a standard is attained.

Only the number and size of release contain measurable quantities. Most importantly, no explanation is provided that explains *how* such measurements (or potential measurements) are biologically relevant to the *goal* (not standard) of minimizing interactions with listed fish. No discussion occurs anywhere in the HGMP to describe how such putative indicators have been or will be employed in guiding and modifying program activities. No detailed monitoring plan employing such indicators and adhering to a biologically relevant timeline is described.

The associated Performance indicator of 6 fpp raises another important issue for this and all HGMPs. Fish-per-pound is hatchery management jargon and not clearly understood by the public. Moreover, where length is of direct relevance to issues such as predation and competitive interactions between yearling steelhead smolts and chinook juveniles, number per pound cannot be directly translated into length or weight without specification of the condition factor of the released fish. We therefore recommend, first of all, that the Fulton condition factor, K (=W(grams)*100/(L(cm)^3) be reported together with both the number of fish per pound and the length in centimeters or millimeters that is associated with the number per pound at the given condition factor. Second of all, we recommend that the distribution of condition factor, length, and numbers per pound be provided for all hatchery releases discussed in the HGMP. Information about the size range of released hatchery juveniles in conjunction with the size distribution of rearing and migrating listed juveniles is critical in estimating the likely adverse impacts of hatchery releases.

In brief, these two sections (1.9 and 1.10) fail to comply with the HGMP Template and NMFS guidelines for completing the Template.

Subsection 1.16. Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

The response to the HGMP is “None”. This is clearly unacceptable and fails to comply with NMFS HGMP Template and guidance. It is incumbent on the HGMP to list and discuss reasonable alternatives to the proposed program that may better satisfy one or more of the program goals, particularly the presumably over-arching goal of eliminating or minimizing adverse impacts on listed fish! In the present case, WDFW has the additional concern pursuant to the Wild Salmonid Policy of considering and avoiding adverse impacts on the Skagit wild winter steelhead population.

Clearly, one possible alternative is to considerably reduce the size of the releases. 334,000 fingerling smolts are proposed to be released and 534,000 is implied to be the co-managers’ goal (Section 1.12, page 6). Another option would be to develop a recovery plan for wild winter steelhead which have recently failed to achieve WDFWs escapement goal. Instead, WDFW is considering simply reducing the escapement goal. A re-direction of agency focus toward wild steelheads recovery in compliance with WDFW’s own Wild Salmonid Policy with funding savings from reducing the hatchery steelhead program being invested in wild steelhead recovery measures in the Skagit River basin is certainly worth *considering and evaluating* at this point in the HGMP. This failure appears to us to be a serious deficiency of this HGMP.

Section 2. Effects on Listed Salmonid Populations.

Section 2.2.3. Hatchery activities that may lead to take.

The response states, in part, that "release of fish described in this HGMP could potentially result in ecological interactions with listed species. The potential ecological interactions are discussed in Section 3.5, and risk control measures are discussed in Section 10.11” (page 9). The HGMP template requests that “annual take levels for listed fish by life stage” be provided. The HGMP refers readers to associated take table (Table 1) at the end of the HGMP (page 34) where the unintentional lethal take of juvenile/smolt is listed simply as "unknown".

No attempt is made to estimate the level of this suspected take, yet this is what is explicitly requested by NMFS in the HGMP Template and in the HGMP Completion Guidelines dated January 5, 2000. Guideline G is especially relevant:

> Under the broad definition of ESA, "take", of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish.

> When "take" of a listed species is expected in the hatchery operation, the ESA **requires** that a numerical estimate be quantified as best as possible. (emphasis added)

Merely listing "unknown" fails to qualify as providing a numerical estimate as best as possible.

Subsection 3.3. Relationship to harvest objectives.

Subsection 3.3.1 of the HGMP template requests a description of "fisheries benefiting from the program" as well as "harvest levels and rates for program-origin fish for the last twelve years (1988-1999), if available." In response the HGMP merely lists “Skagit River and north Puget Sound saltwater (mainly west Whidbey Island) recreational and tribal commercial net fishery”. This response is far too cursory.

In the context of the ESA and the listing status of Puget Sound chinook, it is the alleged benefits to fisheries of program releases that are being weighed against the myriad of risks to listed fish of hatchery operations. This is especially true in the case of isolated harvest programs such as the Marblemount Winter Steelhead program. The HGMP template specifically requests data and detail to quantify an assertion that any particular hatchery program is providing such benefits.

In particular, numbers caught by particular fisheries are not provided, nor is any economic data related to catch or fishing effort reported. Yet such data is fundamental to quantifying and evaluating the benefit to fisheries that it is alleged is the principal purpose and justification for the program. It is difficult for us to understand how NMFS can possibly approve an HGMP such as this that does not even attempt to muster the barest of evidence necessary to support the claim that the program produces benefits. At a minimum these must be characterized and then evaluated against the considerable risks to which yearling steelhead smolt programs subject listed chinook.

Economic data is particularly relevant in the present case in view of the statement in section 1.12 of the HGMP (page 6) that the “tribal goal for hatchery winter steelhead is to harvest 5000 adults commercially. This goal is not being achieved. The non-tribal goals are to have a self-sustaining hatchery run of 400 adults. This equates to a ~1% return on total smolt releases into the watershed (534,000 smolts).” The tribal fishing effort required to harvest 5000 adult hatchery steelhead clearly depends upon the price tribal fishers might receive for steelhead. Based upon testimony by Skagit tribal biologist Robert Hayman during Washington Trout’s litigation of WDFW in 1997 concerning the proposed building of a steelhead hatchery facility at Grandy Creek that proposed to achieve this same release level of 534,000 smolts, since the mid-1990s the price of tribally-caught steelhead has been too low to justify the effort required to harvest 5000 adults. We are unaware that this situation has changed significantly since then. It is clearly incumbent on WDFW in this HGMP to discuss such issues.

It is also important for an HGMP to note when data are lacking or inadequate to permit a reliable estimate to be made of the quantitative contribution of program fish to the fisheries that program releases are being targeted to benefit. When this is the case it would, further, seem necessary and appropriate for the HGMP to explain how the program proposes to address the problem of lack of data.

The cursory and inadequate response gives the impression that program managers believe either that it is obvious that the hatchery program provides fishery benefits that outweigh risks to listed stocks or the appropriate default presumption is that a hatchery program provides such benefits until proven otherwise. In the context of the ESA this is decidedly not the appropriate presumption. To the contrary, the HGMP process and NMFS would appear to be requesting that quantitative evidence be provided of the fishery benefits actually provided by a particular hatchery program. The HGMP patently fails to provide this evidence.

Further, the response fails completely to address the guidance in the HGMP Template that directs the applicant to explain how or if artificial production and harvest management have been integrated.

Section 3.5. Ecological interactions.

Compared to the chinook HGMPs, the Coho and Steelhead HGMPs endeavor to more completely discuss issues related to nutrient enhancement, competition, and predation. Despite the additional discussion the HGMP fails to adequately acknowledge the likelihood of risk to listed chinook from releases of yearling steelhead smolts and reflects several erroneous assumptions regarding juveniles chinook rearing and migration that are common to the chinook HGMPs.

The HGMP continues to rely upon the erroneous and dated one-third body size rule of thumb. The recent peer-reviewed published study by Pearsons and Fritts (1999) that demonstrates that coho fingerling smolts are capable of *successfully* preying upon and *consuming* juvenile chinook 46% of their own body length is mentioned and then ignored without any discussion. This is despite the fact that WDFWs own Salmonid Stock Conservation Science Unit has been developing and refining a predation model for use in assessing hatchery-related risks of just the kind at issue in this HGMP that explicitly incorporates the 46% figure as the appropriate rule of thumb! In addition the HGMP fails to mention that in the same study Pearsons and Fritts documented fingerling coho smolts attacking and *attempting* to consume and *killing* as a result of the attempts juvenile chinook up to 58% of their body length.

The Pearsons and Fritts study also reported results of other studies that evaluated steelhead predation on fingerling chinook, but the HGMP simply refuses to mention this. The studies demonstrated the yearling steelhead smolts (which are significantly larger than coho fingerling smolts whose predation was also studies) preyed upon and consumed chinook fingerlings up to 44% of their body.

At 6 fish-per-pound and a condition factor of 1 (the general target K-factor for WDFW hatcheries), the average yearling steelhead smolt would be196 millimeters long and would therefore be capable (using Pearsons and Fritts data) of consuming juvenile chinook 86 millimeters long. Even an exceptionally heavy smolt with a condition factor of 1.2 would be 185 millimeters long and capable of consuming chinook juveniles up to 81 millimeters long. These sizes are well above the range of *average* lengths of actively downstream migrating juvenile chinook in the Skagit river basin listed in Table 3.5.1 of the HGMP (page 13) even at statistical week 26, the last week in June.

During the time during and immediately following release (May 1 – 15) the average size of the largest, actively-migrating, juvenile chinook caught in the lower Skagit trap is less than 60 millimeters! Even without the proper size distribution data needed to accurately assess the predation/competition risk releases of these smolts poses to listed chinook (see next paragraph) it is more than reasonably clear that fully 100% of listed juvenile chinook rearing and migrating in the Skagit (and present in the estuary in May and early June) are capable of being preyed upon and consumed by these steelhead smolts!

Moreover, the data provided in Table 3.5.1 do not fully or adequately reflect the risk of predation by released yearling steelhead smolts on listed chinook juveniles. This data is average size data only for chinook that are actively migrating downstream. These are the ones that are caught in the migrant traps! Smaller fish still rearing and/or not actively migrating are still present along the migration corridor. In other words, the juvenile chinook sizes from traps reported in Table 3.5.1 at best provide an index of the maximum size of chinook present that might be subject to predation, displacement, and other kinds of competition.

For both the case of actively migrating juvenile chinook caught in migrant traps and the case of non-migrating juveniles size (length) distributions need to be considered and should be provided. Even if the shape of the size distribution is assumed to be normal, there will likely be a significant left-hand tail to the size distribution containing significant numbers of smaller fish. If, as is more likely, the distribution is not normal but skewed to the right, the *mode* of the size distribution will be somewhere to the left of the mean (average) size; in this case, the length interval containing the greatest number of individuals will be composed of fish smaller than the average size. In as much as the purpose of considering this kind of data is to attempt to *quantify* the potential level of take *per* paragraph “G” of NMFS HGMP guidance, these length distributions need to be estimated and appropriately risk-averse estimates of the numbers of listed juvenile chinook of vulnerable sizes present along the migration corridor employed.

The HGMP appears to merely go through the motions of considering competition and predation of yearling steelhead smolts on listed juveniles. It relies upon assumptions such as the one-third length rule of thumb and misleading summary data (the average size data from the migrant traps) that *minimize* the potential predation and competition risks. In addition, in relying upon the one-third size rule the HGMP ignores recent research (conducted by its WDFW's own employees) that demonstrates that the one-third rule is inappropriate. After having done this, the HGMP still refuses to provide a *numeric estimate* of the potential level of take that is likely to result from the proposed releases. Even so, in the case of these large yearling steelhead smolts the capacity for predation on the majority of juvenile chinook present is considerable. This is still the case, if one were to rely upon the erroneous one-third body length rule to estimate predation capacity.

In the context of the ESA it seems clear to Washington Trout that when faced with genuine uncertainty as to a potential harmful effect of a hatchery practice -- resulting either from lack of data and lack of past research, or from uncertainty regarding biological mechanisms involved in potentially harmful inter- and intra-specific interactions -- when estimating the potential level of the harmful impact assumptions ought to be employed that risk over-estimating the level of take, rather than risk under-estimating it! In other words, the estimation process ought to be more concerned with providing reasonably high power (low probability of making a Type II error) than with keeping the probability of making a Type I error low for a null hypothesis that hatchery releases cause no take. The HGMP is simply more concerned with wrongly estimating a level of take from predation by hatchery smolts than it is with failing to guard listed juvenile chinook against the credible risk of take from predation by hatchery smolts. As with most of the numerous factors responsible for the decline and listing of salmonid populations under the ESA, the listed resource is forced to bear the full burden of the uncertainty. This would appear to be patently illegal.

Section 6.1. Broodstock Source.

The HGMP states (page 19) that the hatchery adults collected for broodstock "are of locally adapted Chambers Creek origin and are segregated from the wild population genetically and temporally." No supporting data is provided or cited as required by NMFS. This is of particular concern in that WDFW's claim that Chambers Creek steelhead hatchery stock are "genetically and temporally" segregated from the wild population is controversial to say the least and unsupported. NMFS' own science center genetics staff among others have expressed concern over this claim of temporal isolation. Even some of WDFW's own genetics staff acknowledge unease and concern regarding this belief and its consequences for wild stock viability. In any case it requires to be supported with evidence.

In addition, the claim that the out-of-basin-origin broodstock is "locally adapted" is unsupported and, to say the least, controversial. Supporting evidence and discussion is clearly required.

Section 10.11. Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from fish releases.

The response merely asserts that to "minimize the risk of residualization and impact upon natural fish, hatchery yearlings are released in May as smolts and only in the Skagit River watershed. (page 26). This response is clearly inadequate for several reasons. It simply begs the question that "minimization" is tantamount to "reduction to a level below that which constitutes take". This requires to be explained and demonstrated! As discussed above in regard to section 3.5 there is evidence for considerable risk of competition and outright predation on listed juvenile chinook from the smolt releases at issue in this HGMP.

As is common in all other HGMPs we have reviewed this refusal to seriously endeavor to quantify the level of take is indicative of a cavalier attitude toward the HGMP process and towards the genuine risk that hatchery operations can pose to listed fish. We do not see how NMFS could approve HGMP that refuse to provide the modicum of detail necessary to characterize the risks that the HGMPs are intended to assist NMFS to evaluate and that simply appear to fail to even take the obligation to do so seriously.

Section 11.1. Monitoring and Evaluation of Performance Indicators.

This response in this and the following section is completely identical to the response provided in the HGMP for the Soos Creek Coho program. There is, in other words nothing that is specially crafted for the Skagit basin or that is intended to address the unique aspects of a yearling steelhead program. We are forced, therefore, to repeat our comments to that response.

The response consists principally of assertions that the co-managers intend to conduct some "ongoing monitor (sic!) programs, including catch, escapement, marking, tagging, and fish health testing" and statements of intentions to conduct future research on aspects of juvenile salmon ecology and research to assess the risks of predation on listed species by hatchery coho and steelhead. While this is surely well and good, it fails to address in detail the specific performance standards and indicators listed in section 1.9 and 1.10. Such an endeavor is surely hampered by the fact noted in our comments on those sections that no *bone fide* standards or indicators are provided.

What seems to be required here and is fundamentally missing is a detailed description of the kinds of monitoring currently going on or planned to occur in the immediate future with regard to specific quantitative standards and indicators, especially those pertaining to risk of harm to listed fish. Without a clear account of what kinds of things need to be measured and what the target levels of each is, it is impossible to understand what features or practices of the program could be changed in order to bring about compliance with target levels (standards). Without knowledge of what *could* be changed in order to bring about achievement of (compliance with) a standards neither NMFS not the public can attain a clear idea of what *would* be changed. Absent this, there simply are no standards.

The mere statement of the intention to monitor or conduct research without any substantive details is not in any way an equivalent or an acceptable substitute for a clear quantitative monitoring plan, which specifies both the kinds of program changes that will occur or will be evaluated in response to specific monitoring data and the *period of time* within which such changes will occur and quantitative threshold performance standards will be achieved. The HGMP provides no such detail. It effectively describes no monitoring plan and it has no timelines.

Section 11.2. Indicate risk aversion measures that will be applied to minimize the likelihood for adverse genetic and ecological effects to listed fish resulting from monitoring and evaluation activities.

The fundamental shortcomings noted under section 11.1 are further evidenced by the response to this section, which consists entirely of the statement that "[r]isk aversion measures will be developed in conjunction with monitoring and evaluation plans" (page 26). In other words, there currently are *no* risk aversion measures because there currently appears to be no detailed monitoring and evaluation plan.

This is more than a little disturbing. It would seem to reveal that the implicit program goal suggested in section 1.8 of "minimizing adverse genetic, demographic or ecological effects on listed fish" is not an operative goal or objective at all. The response clearly and simply suggests that there are no currently operative risk aversion standards regarding adverse impacts of hatchery practices on listed fish.

Risk aversion measures should be *implicit* in the specification of quantitative performance standards and indicators, if not explicit! If clear quantitative performance standards and indicators were provided in sections 1.9 and 1.10 as required by NMFS in the HGMP Template and associated Guidance, the appropriate risks to be avoided would be implicitly those required in order to attain the standards! Attainment of the standards, in turn, is evidenced by the attainment of specific levels in the indicators which figure directly in monitoring plans. The monitoring and evaluation plans would be structured by the very statement of quantitative standards and indicators. NMFS requires that these be articulated in section 1 of the HGMP.

That the HGMP can only state that monitoring and evaluation plans are yet to be developed is incredulous. The clear statement with a modicum of detail of a monitoring and evaluation plan, including a description of program responses to failures to attain standards directed at avoiding risk to listed species

is a bare minimum of an acceptable HGMP. We fail to understand how this HGMP could be approved by NMFS when it is so fundamentally incomplete in this regard.

07/20/03

I have examined the Marblemount Winter Steelhead Program HGMP. The Skagit River's wild chinook, as part of listed Puget Sound chinook, are important to me. So too are the wild winter steelhead in the Skagit which have crashed in numbers the past four years.

I do not have the time or resources to fully review all the HGMPs, so I have chosen the Marblemount HGMP as my choice for response from among the list on the Washington Department of Fish and Wildlife's WebPages with a solicitation for public responses through July 18, 2003 (deadline of 5:00PM).

Because of my lack of time to fully research scientific sources to support my concerns, I used what Washington Trout was able to provide me in their own response to the Marblemount HGMP. It is obviously science-based and concurs with my Skagit River concerns. I have attached (or included) their remarks as if they were those of my own. Essentially I am using Washington Trout's response to the Marblemount HGMP as my sole scientific citing because it best fits as a defining reference to the problem.

[WDFW notes: Attachment never received]

07/22/03

I have examined the Marblemount Winter Steelhead Program HGMP. The Skagit River's wild chinook, as part of listed Puget Sound chinook, are important to me. So too are the wild winter steelhead in the Skagit which have crashed in numbers the past four years. I do not have the time or resources to fully review all the HGMPs, so I have chosen the Marblemount HGMP as my choice for response from among the list on the Washington Department of Fish and Wildlife's WebPages with a solicitation for public responses through July 18, 2003 (deadline of 5:00 p.m.).

Because of my lack of time to fully research scientific sources to support my concerns, I used what Washington Trout was able to provide me in their own response to the Marblemount HGMP. It is obviously science-based and concurs with my Skagit River concerns. I have attached (or included) their remarks as if they were those of my own. Essentially I am using Washington Trout's response to the Marblemount HGMP as my sole scientific citing because it best fits as a defining reference to the problem.

[WDFW notes: Attachment never received]

07/24/03

Dear Director Koenings,

I have examined the Marblemount Winter Steelhead Program HGMP and Washington Trout's response. The Skagit River's wild chinook, as part of listed Puget Sound chinook, are important to me. So too are the wild winter steelhead in the Skagit which have crashed in numbers the past four years.

I concur with and endorse the WT comments and urge the Department to accept them.

08/01/03

The HGMP prepared by WDFW for the Kendall Creek Coho Program is inadequate. Considering that it was submitted more than two years past the date established for its completion, one might imagine that its contents would meet or exceed the standards prescribed for such documents under applicable NOAA guidelines. Inexplicably, however this HGMP lacks crucial levels of detail concerning many of the most important aspects of the facility's operations.

Lest it be forgotten, the underlying reason that an HGMP must be prepared for this facility is the recognition by NOAA that hatcheries and their operations pose a risk of harm to species of fish listed for protection under the Endangered Species Act. This HGMP's noncompliance with applicable standards renders it incapable of supporting a Section 10 Incidental Take Permit or, for that matter, any action by NOAA other than a remand to WDFW for further work.

The conservation organization Washington Trout has posted to its website [www.washingtontrout.org] a series of Comments that it has prepared to HGMP's submitted by WDFW for other coho production facilities. This reviewer incorporates by this reference those portions of Washington Trout's Comments which address generic or common responses prepared by WDFW's to the HGMP Template for coho facilities.

Further Comment - Under its Hatchery 4(d) Rule, NOAA is required to evaluate each HGMP for ESA purposes on the basis of standards that are designed to "minimize take and promote conservation of the listed species that may be affected by the hatchery program [January 5, 2000 Instructions and Template transmitted by Memo from Stephen Smith to affected Hatchery Managers - hereinafter, "Instructions"]. The completed HGMP must therefore describe "anticipated take levels, and specific management measures that minimize take of listed species and protect listed ESUs." [Instructions]. The test of each HGMP is whether "sufficient information is provided for the evaluation of the effects of the hatchery program on listed salmonid populations." [Instructions].

To satisfy these stated requirements, an HGMP must therefore provide quantitative data that can be used to evaluate the degree of harm likely to result from the hatchery or its operations. This HGMP is nearly devoid of quantitative data of any sort.

An HGMP is to provide a "single, comprehensive source of information" regarding the hatchery program. [Instructions]. The HGMP template created by NMFS was designed to guide the compiling and analysis of relevant data, and to standardize the form and content of the data, such that in aggregate, these HGMPs could serve as "a source for comprehensive hatchery program information for use in regional fish production and management planning by federal, state, and tribal managers." [Instructions]. This stated goal for HGMP's cannot rationally be fulfilled, however, unless each HGMP, including the one subject to these comments, is completed to the level of detail specified in the instructions.

The information included "should be the best scientific and commercial information available, as it will help determine if hatchery programs are likely to meet their goals and ESA obligations." [Guidelines, Part A]. The SASSI report lists Nooksack wild spring Chinook as "critical", and more recent data have simply confirmed how desperate the plight of these fish actually is. WRIA #1 has adopted a comprehensive interim salmonid recovery plan which has been approved by the regional Co-managers, as well as an on-going Watershed Planning process established pursuant to HB 2514, under which a vast body of high-quality fish presence and fish habitat data, along with water quantity and water quality data have been compiled. While these data clearly represent the "best scientific . information available", almost no reference to such information appears in this HGMP.

The template designed by NMFS staff is designed to provide a "thorough description of each hatchery operation," including the facilities used, methods employed to propagate and release fish, and measures of performance. [Guidelines, Part B]

The Guidelines recognize that under the broad definition of ESA, "take" of listed species can include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. The Guidelines further explicitly state that when "take" of a listed species is expected in the hatchery operation, "the ESA requires that a numerical estimate be quantified as best as possible." (emphasis added). [Guidelines, Part G] This is perhaps the single most important component of the HGMP, considering that the goal of the HGMP is to determine the possible types and levels of harm to listed fish that might be expected from the target facility. This HGMP contains virtually no quantified information regarding costs, risks or benefits.

The Instructions also require that the HGMP "cite relevant reports that describe the hatchery operation and impacts on the listed species or its critical habitat" [Guidelines, Part H]. Citations to a narrow class of literature, along with synopses of such literature, have been provided, but virtually all the cited literature describes uncertainties as to the magnitude of potential harm resulting from various hatchery operations. The use by WDFW of this literature in this fashion seems designed to trivialize the likelihood of harm to listed species. This approach is not balanced. Other relevant literature, which formed the basis for the conclusions reached in the State's Wild Salmonid Policy, is not referenced. To the extent that uncertainties exist as to the magnitude of risk posed by hatchery practices, the uncertainties derive from a lack of data. This HGMP will perpetuate that lack of data, rather than fill in the gaps.

Specific Inadequacies:

Specific failures and inadequacies contained in this HGMP are addressed immediately below, by Section number and title.

1.4) Funding source, staffing level, and annual hatchery program operational costs.

Comment - No cost data are supplied. Sadly, this HGMP is not unique in this regard. This reviewer has examined at least half of the HGMP's submitted by WDFW and its affiliates, and not one of them contained any such data. Such data clearly exist. One wonders whether this failure results merely from indifference, or whether WDFW is attempting to conceal from the public the large costs of its hatchery system.

1.7) Purpose (Goal) of program

Comment - The stated goal is only "augmentation", and to "provide fish for harvest." No further justification is provided. Interestingly, the HGMP admits that the "program was reduced from a release of 1,000,000 yearling smolts (2,000,000 including fry plants) to 300,000 yearling smolts starting with the 1996 brood year (1998 release)." This statement hangs in a vacuum. If the HGMP were truly the "single, comprehensive source of information" regarding this hatchery program, as required in the Instructions, further information would have been provided as to why WDFW agreed to such a dramatic curtailment of its program.

In fact, the reason that WDFW reduced the number of yearling smolts from this facility was that its managers recognized, in discussions with Nooksack system Co-Managers, that listed wild Nooksack spring Chinook were at risk from predation by hatchery coho in the Nooksack system. [various personal communications with Co-Manager personnel]. WDFW further recognized that the Kendall coho program was not the only coho facility in the Nooksack system, and that there would be cumulative impacts on threatened Chinook from the combined product of those programs, on top of a not-insubstantial wild coho population which out-migrates at roughly the same time.

The other Nooksack system coho program is the Skookum Creek program operated by Lummi Nation. That program has historically released in excess of 1,000,000 coho yearling smolts into a Nooksack tributary during the spring out-migration period for Nooksack spring Chinook. The 2003 goal for such releases was the same. [Future Brood Document - http://www.nwifc.wa.gov/03fbd/fnook-sam.txt] . Unfortunately, while this has been the stated goal, in years past, Lummi has released well in excess of a

million smolts per year from this facility. This reviewer has attempted to locate an HGMP filed by Lummi Nation for this facility, but has been unable to locate it on the Web. NOAA must not analyze the Kendall coho program in isolation; the adequacy of its HGMP, and the risk of harm resulting from this facility's operations, must be evaluated in tandem with relevant information regarding the Skookum Creek facility. If that facility has not submitted an HGMP, neither program should be granted ESA protection.

In any event, the local Co-Managers clearly recognize the potential for harm, and the Kendall Creek coho program was curtailed in reference to this perception. The 300,000 smolt release number presently established for this facility presumably relates to some numerically oriented risk analysis that was conducted in advance of the 1996 brood year. Nevertheless, in spite of the fact that numerical estimates are required to be quantified as best as possible in this HGMP, the relevant numerical discussion has been withheld.

Further, the actual number of coho yearling smolts originating from this facility is actually half again as large as stated in this section. As noted in footnotes to Section 1.10 below, an additional 177,000 coho fry are trucked off-site to be released by "salmon-in-the-classroom" projects into Nooksack tributaries at the same time that "critical" threatened Nooksack spring Chinook are emerging from the gravel. Has there been a cumulative impact analysis of the effects of these additional coho smolts? Logically, there should be such an analysis, but none was provided.

1.8) Justification for the program.

The HGMP states, in conclusory fashion, that the subject program will be operated to provide fish for harvest while "minimizing adverse effects on listed fish." It goes on to assert that minimizing harm "will be accomplished in the following manner:

1. Release coho as smolts with expected brief freshwater residence.
2. Time of release not to coincide with out-migration of listed fish.
3. Only appropriate stock will be propagated.
4. Mark all hatchery reared fish.
5. Hatchery fish will be propagated using appropriate fish culture methods, (etc.)

To its credit, the response includes these 5 distinct points describing aspects of program operations that are intended to reduce potential adverse impacts of the release of hatchery fingerlings on listed chinook. However, the measures described by WDFW are overly vague or irrelevant. They contain no appropriate measurable numerical standards. They further make unwarranted assumptions about the sources of adverse impacts and how those impacts may best be minimized. In the context of the ESA it is insufficient merely to assert that program operations will endeavor to minimize adverse impacts to listed species. It is necessary to quantify the level of take likely to result from these operations; that is, it is necessary to quantify the amount of take that is expected to result when program operations are configured so as to produce a "minimal" level of impact.

Point #1 asserts that juveniles will be released as smolts to minimize time of out-migration from freshwater to saltwater so as to minimize potential competition and predation on listed fish. This ignores the fact that the larger release size of the coho smolt produces a greater threat of predation upon listed species than a release strategy focusing on fingerlings.

Point #2 asserts that juveniles will be released after the usual time of out-migration of wild Chinook smolts in order to minimize potential adverse interactions. This implies a gross over-simplification of the temporal distribution of the migration of wild listed juveniles from freshwater to saltwater habitats. Recent data on the timing of wild juvenile Chinook out-migration in WRIA No. 1 [Specifically, the Smolt Trap data gathered and maintained by the Lummi Nation from 1994 to present] provides substantial evidence that juvenile Chinook fry and smolt out-migration of both wild and Kendall-hatchery origin generally occurs over a protracted period of time ranging from February to July. These data are noteworthy in displaying no pronounced mode in the timing of wild chinook out-migration. Rather, out-migration appears to be more or less continuous with several small pulses scattered from mid-March to mid-June. This makes it

extremely unlikely that hatchery smolt releases can be scheduled to occur "after the usual wild Chinook out-migration time" as asserted by point #2, unless hatchery releases occur in late July.

Points # 3 & 4 are not really relevant to interactions with listed populations.

1.10) List of program "Performance Indicators", designated by "benefits" and "risks."

The HGMP summarizes the "performance indicators" with the phrase: "Performance Standards and Indicators for Puget Sound Integrated Harvest Coho programs."

The instructions clearly require discussions of "risks" and "benefits" in relation to identified Performance Standards and Indicators appearing in the standard matrix for this Section. The reason for such instructions, in relations to ESA "take" issues, should be obvious. Nevertheless, this HGMP never mentions those words, and the information contained in this key Section is sparse, self-serving, conclusory and in some cases even factually inaccurate.

None of the items listed under the heading "Performance Indicator" corresponding to any of the stated "Performance standards" is identified as an "indicator" nor are most of them evidently relevant to the goal of minimizing adverse interactions with listed fish.

The remarks under the heading Monitoring and Evaluation Plan contain no measurable criteria or numerical threshold values, nor standards against which to measure impacts of hatchery releases on listed juveniles. Nor do they contain or reference any timeline for changing program attributes so as to minimize adverse impacts discovered in the course of a monitoring program.

This is a section of the HGMP template that really cries out for numerical analysis, in order to satisfy the requirements of the Instructions. No such analysis is provided. This Section is clearly insufficient to support acceptance by NOAA.

1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

WDFW's response is "None". In the opinion of this reviewer, this response is not only non-compliant with the Instructions, but is in addition arrogant in the extreme. A reasonable alternative could be to reduce the number of smolts released from the facility, or to reduce or eliminate entirely the "salmon-in-the-classroom" programs associated with this facility, which are run outside the control of WDFW. Considering that no real monitoring and evaluation programs are described in Section 1.10, perhaps it is too much to suppose that WDFW would perceive any need to consider alternative actions.

This reviewer recommends that NOAA examine the relationship between these two Sections carefully. If WDFW actually had a real Monitoring and Evaluation Plan, as required under Section 1.10, with numerical thresholds and tolerances sufficient to meet the requirements of the ESA, WDFW would logically also then have a list of Alternative Actions that could be implemented in the event that future efforts at monitoring and evaluation evidenced a need for such. The response to Section 1.16 appears to be living proof of the inadequacy of its response to Section 1.10. One is led to question whether, in absence of an ability or willingness to consider alternatives, and to monitor and evaluate data suggesting the need for same, WDFW can be trusted to run any of these programs in a way that truly "minimizes impacts to listed species."

Peer-reviewed literature now recommends that the "precautionary principle" be applied when managers address the needs of threatened and endangered species [Dayton, 1998, Musick 1999, cited in ISAB, "Hatchery Surpluses in the Pacific Northwest", Fisheries, Dec., 2002]. The precautionary principle requires that managers either demonstrate that their activities will not produce adverse impacts, or establish precautionary measures to detect problems and intervene if such impacts are realized. [Hillborn 1997, cited in ISAB 2002]. The precautionary approach also suggests that management actions be reversible if found to yield unintended results. [ISAB 2002].

Given that the Nooksack spring Chinook population is the most northerly population or stock of listed Chinook in the Puget Sound ESU, management efforts to protect this stock must be highly sensitive. Perhaps other stocks in the ESU could go extinct and not harm the overall viability of the ESU, but that cannot reasonably be argued with respect a population which defines the northernmost edge of the spatial range of the ESU.

For purposes of ESA analysis, the critical Nooksack spring Chinook population deserves better protection. WDFW's failure to consider alternatives to this hatchery program warrants rejection of this HGMP.

SECTION 2. PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS.

2.2.1) Description of ESA-listed salmonid population(s) affected by the program.

- Identify the ESA-listed population(s) that will be directly affected by the program

WDFW's response to this Section is "None". This is pure sophistry, and should not be legally supportable. This reviewer submits that when adverse species interactions, and especially that of predation, are known to impose a non-trivial risk of harm upon members of listed species, and members of the listed population are actually impacted as a result, a direct "take" of the listed species has occurred. In the present context, predation on Chinook by coho can always be expected. It happens in the wild. When it happens in the wild, of course, no "take" can occur.

However, a "take" can and will occur when artificial introductions of massive quantities of hatchery-produced coho predators are deliberately released in grossly unnatural numbers, of grossly disproportionate individual size, in unnatural concentrations and at unnatural times of year, into waters containing vulnerable wild Chinook juveniles that otherwise would not be subject to such additional predation.

The goal of this hatchery program is to produce adult fish for harvest. In order to attain this goal, the smolts released from this facility must eat voraciously and grow to harvestable size. This is self-evident and commonly understood.

Under established legal principles, we are all held to intend the natural and probable consequences of our actions. [Prosser, Torts]. WDFW intends that its hatchery smolts out-migrate from its facilities and "fatten up" to harvestable size in the wild environment, by eating other creatures that they encounter in their extended migrations. Conversely, unless these fish eat lots of other creatures, they do not fatten up to harvestable size. Since WDFW also knows that its hatchery coho smolts are highly piscivorous, and that threatened spring Chinook are directly downstream in the path of those coho smolts, then it is no exaggeration to state that WDFW legally intends that a "take" of listed species occur when these hatchery coho predictably eat threatened spring Chinook.

Where a "take" of listed fish is literally and legally intentional, it logically cannot be said to represent a mere "incidental take".

- Identify the ESA-listed population(s) that may be incidentally affected by the program.

To its credit, WDFW does describe in some detail the ESA-listed populations that may be impacted by this hatchery program.

2.2.2) Status of ESA-listed salmonid population(s) affected by the program.

- Provide the most recent 12 year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed population. Indicate the source of these data.

To its credit, WDFW provides some data in this regard, although those data are now largely out of date. The data produced, however, demonstrate the dire plight of the wild component of the Nooksack spring Chinook run, which is returning at much lower than replacement values.

For the North Fork, wild / hatchery ratio for 1995 to 1999 = .31:1 average (range 3.3:1 to .11:1). The recruit / spawner ratio range for 1995 to 1999 = .00000 to .53333 fish per spawner.

While the HGMP states that there are "limited data for the South Fork wild/hatchery ratios in these categories," there are actually newer data which show that the wild South Fork population has been overwhelmed in recent years by returning adult Chinook of Kendall hatchery origin straying into historic South Fork spawning beds. In a footnote to Section 2.2, WDFW notes that in 1999 and 2000, 55.6% and 32.4%, respectively, of the carcasses surveyed in the SF Nooksack were strays from the NF Nooksack Kendall stock rebuilding program.

This danger has been fully understood by Nooksack basin Co-managers. The Nooksack Tribe's chief biologist, Bob Kelly, recently wrote a letter to the "salmon recovery" community in WRIA #1, which contained the following language:

We have concerns {that the adult Chinook return statistics} misrepresent the extent of the dire situation of the North/Middle Fork stock, as well as the extent to which we are approaching recovery. Only wild chinook (those that were naturally spawned) are considered in evaluating progress towards our recovery goals, and 94% of the 3,687 adults originated from the hatchery. Similar to numbers for the South Fork early chinook, the number of naturally produced North/Middle chinook is closer to 200. In fact, the Kendall hatchery program releases are being reduced, because, once again, we had a high percentage of Kendall origin North Fork chinook which strayed to spawn in the South Fork (over 50% of South Fork early chinook spawners). With only about 200 wild chinook returning, rather than 3,687, we don't want people to be misled about how far we have to go to reach recovery, and the extent of habitat improvements that are needed for us to achieve this.

Aside from the fact that this information demonstrates multiple failures of WDFW's Kendall Chinook program, which are identified in separate Comments that this reviewer is submitting for consideration by NOAA, it must now be explicitly recognized that WDFW cannot be permitted to hide behind statements that it is unaware of evidence of the magnitude of adverse impacts of its coho hatcheries on listed species. Since Kendall hatchery Chinook are returning at significantly greater than replacement values, while their wild conspecifics are deteriorating, and ocean survival conditions are constant with respect to both populations, the only logical hypothesis becomes that something in the freshwater environment confers survival advantage on the hatchery cohort of this critical Chinook population.

While hatchery rearing can be expected to increase egg to fry survival, the smolt to adult survival rate should actually favor the wild cohort. The fact that the empirical evidence fails to bear this out in the Nooksack must be cause for both concern and direct action. This HGMP provides no assistance toward these objectives.

Members of the hatchery component of the Nooksack spring Chinook population are, because of hatchery feeding practices, larger on average than their wild counterparts. Since many of the hatchery Chinook fry are raised in satellite rearing facilities high in the system, these hatchery Chinook migrate downstream later than their wild counterparts rearing lower in the system. Since larger body size confers an advantage in predator avoidance, and since later out-migration may minimize the likelihood of encounters with hatchery coho, predation by out-plants from the Kendall and Skookum Creek coho programs may logically be regarded as a very significant factor in the disparate return rates between the wild and hatchery components of this "critical" threatened spring Chinook population.

WDFW needs to adopt real Monitoring and Evaluation programs designed to test this hypothesis. WDFW also needs to expressly consider reasonable "alternatives" to its coho hatchery program against the eventuality that such monitoring and evaluation demonstrates significant "take" from the effects of predation.

- Provide the most recent 12 year (e.g. 1988-1999) annual spawning abundance

estimates, or any other abundance information. Indicate the source of these data.

Comment - The HGMP acknowledges that a huge proportion of South Fork Nooksack spawners have been identified as being strays from the NF Nooksack Kendall stock rebuilding program. See comments above for Section 2.2.1.

2.2.3) Describe hatchery activities that may lead to take of listed fish in the target area.

_____

- Provide information regarding past takes

The answer of "unknown" demonstrates a need for a good evaluation and monitoring effort.

- Provide projected annual take levels, quantified..

Comment- The reference to the "Take Table" merely defers the reviewer's continuing disappointment. The information contained in the "Take Table" merely re-states the common theme of lack of knowledge. Parenthetically, the Take Table itself contributes to the poor quality of the responses present in this HGMP. Its matrix contains no cells for species interactions or the other sorts of hatchery-related harm to listed species that are commonly understood among competent scientists.

- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.

Comment - It is disappointing, if not surprising that no contingency plans exist for this facility, considering that no "take levels" have been established and no credible monitoring and evaluation programs have been identified.

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER

MANAGEMENT OBJECTIVES

3.4) Relationship to habitat protection and recovery strategies.

Comment- The stock response by WDFW to this question is unacceptable. The question is how THIS FACILITY and its operations relate to other management objectives. WRIA No. 1 has adopted an Interim Salmon Recovery Strategy which addresses at least the supposed habitat needs of wild spring Chinook. Efforts are underway to complete the final Salmon Recovery Strategy for WRIA No. 1; in this reviewer's opinion, it will not meaningfully address hatchery and harvest issues, since such matters represent the "turf" of the Co-Managers; it will also probably not meaningfully address the needs of Bull Trout. Thus, a detailed response to this question needs to be included in this HGMP.

3.5) Ecological interations-

Comment - The HGMP finally begins to address the very real risk of fresh-water predation on listed species in this section. Unfortunately, it addresses that risk by using volumes of statistics apparently designed to obscure the true magnitude of that risk. The HGMP's analysis all centers around the assumption that coho don't prey upon other fish that are larger than one-third of their own body length. The recent peer-reviewed published study by Pearsons and Fritts (1999) demonstrates that coho fingerling smolts are capable of successfully preying upon and consuming juvenile chinook 46% of their

own body length. This study is mentioned and then ignored without any discussion. This is despite the fact that WDFWs own Salmonid Stock Conservation Science Unit has been developing and refining a predation model for use in assessing hatchery-related risks of just the kind at issue in this HGMP. The model explicitly incorporates the 46% figure as the appropriate rule of thumb. In addition the HGMP fails to mention that in the same study, Pearsons and Fritts documented fingerling coho smolts attacking, attempting to consume and killing juvenile chinook up to 58% of their body length.

During the time during and immediately following release (May 1 - 15) the average size of the largest, actively-migrating, juvenile chinook caught in the lower Skagit trap is less than 60 millimeters. Even without the proper size distribution data needed to accurately assess the predation/competition risk which releases of these smolts pose to listed Chinook it is clear that a huge percentage of listed juvenile chinook rearing and migrating in the Nooksack (and present in the estuary in May and early June) are capable of being preyed upon and consumed by hatchery coho smolts.

The public is entitled to more information than is provided in this HGMP, and listed Nooksack Spring Chinook and Bull Trout deserve better protection than that afforded in this HGMP. Instead of using the best currently available information and science, this HGMP relies upon old assumptions, apparently in an effort to obscure the degree of harm and legal "take" of listed salmonids species that may result from the operations of this facility.

08/01/03

Dear Director Koenings,

Attached is a file containing HGMP Review comments for the Dungeness River Chinook Program. The comments are being submitted on behalf of the Northwest Women Flyfishers organization for WDFW review and response.

Attachment on the following page

Comments and Questions on Dungeness River Chinook Program HGMP submitted to WDFW August 1st, 2003

HGMP for the Dungeness River Chinook - last updated August 20, 2002

Section 1. General Program Description

1.7 Purpose (Goal of the Program)
Response: The goal of this program is the restoration of the indigenous Chinook salmon to a self-sustaining level in the Dungeness River watershed.

NWF Question: What is the measure for determining a self-sustaining level and how is it measured throughout the watershed?

NWF Question: At what cost to wild Chinook salmon is a self-sustaining level of hatchery salmon achieved?

NWF Question: Shouldn't the goal be to achieve a self-sustaining level of wild salmon, not hatchery salmon?

NWF Question: How are wild salmon being protected from adverse genetic, demographic or ecological effects on Chinook resulting from the hatchery operations?

1.8 Justification for the Program
Response: The Dungeness River Chinook returns have declined to critically low levels leaving them at risk of extinction. . .

NWF Question: Why have the Dungeness River Chinook returns declined?

NWF Question: Is a hatchery operation with integrated recovery the safest and most effective way of restoring indigenous Chinook?

NWF Question: How have the causes for declining Chinook returns been mitigated?

NWF Question: Will Chinook continue to decline when the hatchery operation ceases?

1.9 List of Program "Performance Standards"
Response: No response given

NWF Comment: Please provide quantitative, non-generic performance standards that can be used for measuring program performance.

1.10 List of Program Performance Indicators, designated as "benefits" and "risks "

NWF Comment: Please provide quantitative, non-generic performance indicators that can be used to quantitatively evaluate "benefits" and "risks".

NWF Comment: In reference to the performance standard "Minimize interactions with listed fish through proper broodstock management" Why is the adipose fin not clipped on hatchery fish? How is the public able to identify hatchery vs. wild Chinook?

1.11 Expected Size of Program

NWF Question: How does the number of hatchery releases per life stage compare to the number of wild Chinook?

1.12 Current Program Performance

NWF Comment: Please provide performance data and include performance in relation to wild Chinook restoration – relating it back to the program goal. Shouldn't the program performance be able to be evaluated by now?

NWF Comment: Please provide stray rates (%hatchery spawners present on spawning ground with listed fish in specific areas of the watershed).

NWF Comment: Hatchery smolt-to-adult survival rates and wild smolt-to-adult survival rates. This information is also requested under 2.2.2.

NWF Comment: Please establish a minimum wild smolt-to-adult survival rate needed to insure the recovery and long-term persistence of wild Chinook.
This information is also requested under 2.2.2 Status of ESA-listed salmonid populations.

1.13 Expected Duration of Program

NWF Question: The stated end of program date is 2004. Based on the current stated wild Chinook escapement figures and the stated annual goal of 925 spawners in three of four consecutive years what is the current outlook for the hatchery program to terminate in 2004?

NWF Question: How can performance be improved to achieve the wild Chinook escapement goals?

General Questions:

1. Based on the performance to date in restoring wild Dungeness River Chinook to sustainable levels has this hatchery program been effective and should it continue to be funded by the State?
2. We suggest that each HGMP include an executive summary so to facilitate public review of HGMP's.
3. We suggest that each hatchery provide a public presentation to residents in the related watershed. Questions and comments from the public could be recorded at the presentation.

We look forward to receiving WDFW's response to the above questions and comments.

08/01/03

Dear Director Koenings,

I respectfully submit these attached comments to Washington State Department of Fish and Wildlife (WDFW) Hatchery Genetic Management Plans for WDFW Puget Sound Hatchery Programs on behalf of Washington Trout's members and staff. I commend WDFW for taking on the monumental task of developing HGMPs for their hatchery program. We believe that developing technically and legally sound HGMPs are an important and necessary step in the recovery process of Puget Sound wild chinook.

You will observe in our comments that we are critical of the overall success of this endeavor. We are principally concerned that the HGMPs generally fail to provide the information needed to qualify for take authorization. I hope that our comments will increase, not decrease, the frequency and specificity of communications between WT and WDFW while the Department prepares its responses to these comments and throughout the final development of these HGMPs.

Attachment on the following pages

Comments on WDFW Chinook, Coho, and Steelhead
Hatchery and Genetic Management Plans
for Puget Sound;
Submitted to Washington Department of Fish and Wildlife
by Washington Trout,
August 1, 2003

Prepared by
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INTRODUCTION

Washington Trout has reviewed all of the chinook Hatchery and Genetic Management Plans and all of the coho and steelhead Hatchery and Genetic Management Plans currently submitted by the Washington Department of Fish and Wildlife to the National Marine Fisheries Service, in application of take authorization under the Endangered Species Act 4d Rule for the Puget Sound chinook ESU. We are submitting the following sets of comments to WDFW for its consideration and response under this established public-input process. We believe it is appropriate to address our comments to the chinook and the coho/steelhead HGMPs as packages , as the HGMPS have been submitted to NMFS for approval as packages, attached to the *Joint Resource Management Plan for Puget Sound Chinook Salmon Hatcheries,* August 2002, and a proposed *Joint Resource Management Plan for Puget Sound Steelhead, and Coho, Pink, Chum, and Sockeye Salmon Hatcheries,* March 2003.

This review in most part focuses on some general concerns Washington Trout has identified that run throughout all or many of the chinook, coho, and steelhead HGMPs. These include our assessment that:

- In general, the HGMPs fail to adequately describe clear program goals, justifications, performance standards and indicators, or adequately detailed monitoring and evaluation protocols or timetables;
- A number of erroneous and/or unsupported assumptions run throughout the HGMPs;
- Many of the HGMPs contain critical deficiencies and omissions;
- There is a consistent failure to quantify, as required, the estimated take of listed Puget Sound chinook;

- The overall size of the chinook hatchery program in Puget Sound is far too large with respect to any reasonable “acceptable levels” of competition, predation, and related genetic and ecological impacts upon indigenous wild chinook;
- The overall size of the coho and steelhead hatchery programs in Puget Sound are far too large with respect to any reasonable “acceptable levels” of competition, predation, and ecological impacts upon indigenous wild chinook;
- The HGMPs are often in direct conflict with critical elements of WDFW’s own Wild Salmonid Policy.

The HGMPs generally provide no reason to believe that unacceptable levels of take of listed species will not occur as a result of hatchery operations proposed and described in each. The HGMPs commit to no readily identifiable, measurable performance standards or indicators. Nor do they identify alternative management actions that will or might be undertaken in light of the evaluation of the results of a clear quantitative monitoring program.

The intent of the HGMP Template and process would appear to be to evaluate several broad factors -- the justification for or benefits derived from a particular hatchery program, the current state of the affected listed population, the potential for the program to take listed species, and the specific measures proposed by the program proponents to minimize that take (including the ongoing monitoring and evaluation of those measures) -- and to weigh these factors against each other in order to determine if take authorization is warranted. In general, the responses provided to individual queries in the HGMP Template that would address these factors are cursory, lacking in sufficient detail, and often inappropriate.

Many of the HGMPs contain essentially the same answers to critical sections of the HGMP Template that deal with program justifications, performance standards, alternatives to the proposed actions, and the monitoring and evaluation of the proposed action, often utilizing the same vague language, consistently failing to adequately address these particular queries.

For example, Section 1.8 requests justification for the described program. Throughout the HGMPs, WDFW repeats the same answer, “This program will be operated to provide fish for harvest while minimizing adverse genetic, demographic or ecological effects on listed fish.” The HGMPs consistently fail to discuss why it is socially, economically, or biologically necessary, advisable, or even beneficial to provide fish for harvest using the described program. Many fail to even describe in sufficient detail what contribution the program is providing to any harvest benefit. Measures to assure that “adverse genetic, demographic or ecological effects on listed fish” are being minimized are never adequately described. Indeed, the level of these effects that WDFW would consider adequately “minimized” is never identified, nor is any effort to monitor how and when these effects will indeed be minimized described in any detail.

Section 11 addresses the monitoring and evaluation of program performance indicators. WDFW consistently inserts the same language, often verbatim, in its responses to this section, asserting that production groups of released hatchery fish will bear one or more of several kinds of marks that will enable them to be identified in fisheries and on the spawning grounds.

At best, the response describes marking that will create a *potentia*l for monitoring impacts of hatchery fish on wild fish, particularly in regards to straying onto the spawning grounds of natural origin fish. The HGMPs fail to describe impact-containment objectives for the measurement of which specific marks are relevant, or how, when, or where data will be collected using these marks. Specific ranges or levels of impact of concern need to be explicitly stated (as quantitative performance standards), the means and manner by which such levels will be estimated and or identified using measurable quantities (performance indicators) and a range of management responses to various measured levels of each indicator identified. In brief, no program-specific monitoring plans are identified or described, and no standards have been specified against which the results of monitoring could be *evaluated.*

These and other redundant failures to adequately address the broad factors by which the HGMPs can be objectively evaluated run throughout the chinook, coho, and steelhead HGMPs. For this reason, this review has by and large elected not to comment on the specific descriptions of individual hatchery

programs. Without adequate descriptions of the factors against which the specific operations of any individual program could be evaluated and weighed, it is impossible if not irrelevant to attempt determine the appropriateness of granting take authorization for that program, particularly given the consistent failure to even quantify the level of take occurring or expected to occur from those operations.

This election not to comment on any specific hatchery practices should not be necessarily interpreted as approval of those practices. In general, Washington Trout is skeptical about the size and scope of individual programs and the PS hatchery program in aggregate, about rearing and release strategies and techniques employed by WDFW, and about many of the fundamental assumptions underlying WDFW hatchery practices. We have provided some general and miscellaneous comments that reflect this skepticism where it seemed particularly pressing or appropriate, and provided references that support those comments. However, in general we believe it is premature to evaluate specific practices without adequate information regarding the factors those practices should be weighed against in the context of granting take authorization under the 4d Rule.

The following general comments can, and should where appropriate, be applied to most if not all of the PS chinook, coho, and steelhead HGMPS currently available for public and federal agency review. Several sets of detailed comments on specific, representative HGMPs are included with these general comments. These specific-HGMP comments address in detail and demonstrate the repeated, often redundant failure of the HGMPs to adequately address critical factors that must be evaluated in order to objectively judge whether the proposed hatchery programs should qualify for take authorization.

These comments may appear to address directly only a small fraction of the HGMPs currently under review. For example, we are submitting detailed comments on only one representative steelhead and one representative coho HGMP. However, the election of this review to not specifically comment on any individual HGMP should not be interpreted as approval of that HGMP or a disinclination to review it. With some slight variation to account for the minor idiosyncrasies of each HGMP, the individual reviews submitted demonstrate how virtually the same set of comments applies to the same evaluated sections of each HGMP. This pattern is repeated throughout the chinook HGMP package, and to some extent throughout the coho and steelhead package as well.

Rather than repeat essentially the same set of comments for every HGMP, we believe the critical, central issues addressed in our extant comments can in most instances be applied to all or most of the HGMPs. Therefore, where in any other individual HGMP the responses to the specific sections cited in these reviews are substantively similar to those evaluated in these reviews, or fail to adequately provide the types of required information identified in those reviews, then those elements of our comments that can be reasonably applied to those responses should be considered as submitted comments to that individual HGMP, and should be responded to in the context of every applicable HGMP.

Several more sets of miscellaneous reviews comment on specific aspects of other representative HGMPs. Again, wherein other HGMPs these comments can be appropriately applied to similar responses to the same HGMP section, they should be considered as comments to those specific HGMPs, and responded to accordingly.

GENERAL COMMENTS AND CONCERNS

Failure to Describe Program Goals, Justifications, Performance Standards and Indicators, or Monitoring and Evaluation Protocols or Timetables

The HGMP Template requests that hatchery program goals be stated at the outset (Section 1.7). Most individual HGMPs fail to clearly identify or articulate goals. In general, most HGMPs implicitly (if not explicitly) suggest that individual programs have at least two goals: producing fish for harvest, and "minimizing adverse genetic, demographic, or ecological effects on listed fish". In all HGMPs, these or similar goals require to be clearly articulated in order that clear and relevant justifications for each can be provided (in section 1.8) and subsequently evaluated by NMFS and by the public.

The justification for the individual programs is at best inadequately described. In general, all HGMPs substitute assertions of alleged benefits and assertions of intentions to "minimize" adverse impacts for

detailed discussion of the relevant biological, economic, or social principals and reasons for believing that the benefits will result and/or the adverse impacts will be minimized.

None endeavor to argue or provide evidence that the alleged harvest-related benefits of the program can reasonably be believed to outweigh the potential risks to listed chinook. This is a grievous failing since the entire context is one where alleged benefits of hatchery practices must be reasonably shown to outweigh the risks of harm to listed populations sufficiently to justify the exemption from 4(d) take that is being sought by the submission of the HGMPs and the associated RMP.

The HGMP Template and NMFS Guidelines for completing the template request basic information regarding levels of unintentional or indirect take at three basic salmonid life stages (egg/fry, juvenile/smolt, and adult). NMFS guidance requires that a "numerical estimate" of expected take levels be provided and supporting documentation provided or cited. Too often, the level of unintentional or indirect take at each life stages is described as "unknown," if it is addressed at all. Measures to minimize take are either inadequately described or based on assertions left unsupported by any documentation.

Sections 1.9 and 1.10 require descriptions of Performance Standards, Performance Indicators and related Monitoring and Evaluation programs and procedures. NMFS is very clear that identifiable quantitative measures that are clearly related to program goals and objectives and that can serve as monitoring variables be identified. All HGMPs fail to provide or identify such quantitative measures, and in general seem to confuse assertions of goals and objectives with descriptions of standards and indicators. This issue has arisen early in the process of developing the HGMP Template in connection with the Northwest Power Planning Council's Artificial Production Review in the Columbia River Basin, and it is germane to quote the Independent Science Advisory Board (ISAB) review of the Draft Performance Standards and Indicators for Artificial Production in the Northwest Power Planning Council's Artificial Production Review (ISAB 2002-2, February 23, 2000) which NMFS places on its HGMP website as an accompanying document for completing individual HGMPs:

- A standard is a *quantifiable* state or condition described in such a way that it is easy to determine whether or not it is being met (emphasis added);
- Indicators are a list of *measurable metrics* that bear directly on the quantitative determination as to whether or not the standard is being met (emphasis added) (p. 6).

No HGMP reviewed rises to this elementary standard of articulating performance standards and indicators relevant to program goals and objectives, especially those objectives concerned with quantifying potential levels of take and minimizing adverse impacts on listed fish.

Genuine and appropriate standards and indicators are essential to the establishment and the implementation of hatchery program monitoring and evaluation plans. They establish the list of measurable metrics that could be employed to monitor program performance. In the absence of such metrics, the HGMPs' efforts to describe monitoring and evaluation are inevitably vague, and unacceptably so. No timelines are provided for gathering needed information or meeting performance standards.

This vagueness has the result that neither NMFS nor the public can or will be able to determine whether or not any particular program is achieving its stated or, more often, implied goals and objectives, particularly where take of listed Chinook is concerned. Washington Trout believes that quantitative standards that provide clear threshold levels of potential adverse impact to be avoided need to be stated and then clearly linked to quantitative monitoring variables and monitoring plans containing detailed timelines for achieving biologically appropriate performance standards. All the Puget Sound HGMPs fail to meet these criteria.

We believe all of these to be serious failings that make it impossible to approve the HGMPs in question.

Erroneous Assumptions

The HGMPs rely upon tenuous, uncertain, and even false assumptions concerning the rearing and migratory behavior of listed juveniles and the conditions under which competition and predation by hatchery juveniles may occur. All HGMPs rely heavily on what appears -- by virtue of recent published research by some of WDFW's own staff (Pearson & Fritts 1999) -- to be an outdated and now disproven rule-of-thumb regarding the maximum relative difference in size between a salmonid predator and its prey. The rule-of-thumb is that salmonid predation is limited to prey that are one-third or less the length of the predator. Pearson and Fritts (1999) found that juvenile coho actually consumed chinook that were up to 46% of their length and attempted to eat chinook up to 58% of their length - often killing them in the process. The same authors also cited studies on steelhead showing predation on salmonids at 42 and 44%, respectively, of their lengths. Moreover, based upon other recent WDFW internal review documents we have examined, WDFW's own Salmonid Stock Conservation Science Unit staff is developing a predation risk model for addressing these kinds of hatchery-based risks to wild populations. All draft versions of this modeling exercise rely upon the 46%/58% of predator length as the threshold prey lengths for estimating coho predation risk. Yet all of the HGMPs examined that mention any relative lengths at all mention only the outdated and disproven one-third predator length rule-of-thumb.

These errors are further compounded by using wild chinook size distribution data from downstream migrant trapping studies to describe the lengths of wild juveniles and the proportion of them that would be subject to predation risk by larger hatchery juveniles. At any given point in time, the largest wild chinook of any year-class that will be present in downstream migrant traps will be those that are actively migrating downstream. The smaller individuals will still be upstream rearing. These are the fish that would be most impacted by yearling chinook, coho, and steelhead predation.

Another assumption with far reaching implications for under-estimating the predation and competition impacts of hatchery releases on wild juveniles is an assumption about the amount of time that juvenile ocean-type wild chinook will be available to compete with and be preyed upon by hatchery fish. The HGMPs simply assume that there is a unique and narrow period of time during which an overwhelming majority of wild juveniles migrate downstream and out of the river basin. Hatchery release protocols that are asserted to be aimed at minimizing adverse impacts on migrating wild juveniles are then stated to be ones of releasing hatchery juveniles several weeks prior or subsequent to this assumed period during which the majority of wild juveniles are assumed to have migrated.

Contrary to such assumptions and assertions, wild fish will commonly be available as rearing fish and as downstream migrants in freshwater habitats for a three to four month period. Considerable information in support of this comes from WDFW reports of downstream trapping from the Skagit, Cedar and Green rivers and Bear and Issaquah creeks in the Lake Washington system (Seiler et al. 2002a, 2002b, 2003). These reports provide substantial evidence that wild juvenile chinook downstream migration generally occurs over a protracted period of time ranging from February to July. The majority of this data is noteworthy in displaying no pronounced mode in the timing of wild chinook outmigration. Rather, outmigration appears to be more or less continuous with several small modes scattered from mid-March to mid-June.

These same fish will be available (as documented in other state and tribal reports) in estuaries and nearshore marine habitats for several additional months (e.g., Beamer et al 2000). Thus, there is really an extended period of up to six months in which problems with competition and predation will occur.

Critical Deficiencies and Omissions

One of the most frustrating problems that is found in every HGMP is the consistent use of numbers of fish per pound for hatchery fish (or sometimes average lengths), with no usable conversion factors to length and length-frequency distributions. This makes it practically impossible to evaluate potentials for competition with and predation upon wild fish, especially ocean type juvenile chinook, since these interactions are largely determined by relative size (i.e., length) differences between the interacting individuals (as discussed above under "Erroneous Assumptions"). This is especially true for evaluating potential interactions between hatchery fingerling and yearling chinook and wild chinook fry and fingerlings and hatchery fingerling and yearling coho and juvenile chinook.

Where predation on wild chinook by hatchery steelhead is at issue, the absence of length data for the hatchery fish is less of a problem, though still not negligible, since the size disparity is great enough to insure that predation will have a high probability of occurring. An internal WDFW report that we reviewed ("Study Travel Rates of Hatchery Smolts") stated that hatchery steelhead smolts "are typically 4-7 fpp. That equates to around 200---166mm (fl). I don't have any data on C.V.'s. This means that they are all large enough to eat most of the naturally produced chinook they may encounter on their downstream migration."

All of the HGMPs are silent about the implications of premature releases of hatchery fish. This is rarely evaluated, but a recent WDFW report on downstream trapping in Issaquah Creek during the year 2000 (Seiler et al. 2003) states as follows (page 138): "Using our average daily trap efficiency estimate, a total of 28,000 chinook and 32,000 coho are estimated to have escaped prior to their respective hatchery release dates." These fish would pose entirely different potential problems with respect to predation and competition than the planned releases, since these individuals would likely not be ready to migrate, would be more likely to residualize, would need to feed in the river system and would therefore be even more likely to prey upon and compete with smaller rearing salmonids, including listed chinook juveniles. Each HGMP should evaluate the potential for unplanned releases such as those observed in Issaquah Creek in 2000.

The HGMPs also need to state the size distributions of wild fish in every case where hatchery fish of the same species are being released. Problems with competition and predation are greatly exacerbated when the hatchery fish are significantly larger than wild fish in the same stream system. This is especially critical with hatchery coho and steelhead yearlings preying on ocean type chinook and with hatchery chinook competing with wild chinook. In general all of the HGMPs fail to provide the kind of comparative size information required to even begin to ballpark the probable extent of the competition and predation impacts of hatchery juveniles on wild juveniles likely to result from proposed hatchery releases.

Failure to Quantify Take of Listed Puget Sound Chinook

NMFS in its January 5, 2002 guidance document titled *Hatchery and Genetic Management Plan Template: Purpose, Applications, and Instructions,* clearly directs HGMP applicants to supply a "numerical estimate" of expected take from hatchery operations "as best as possible". Paragraph G is particularly explicit:

> "Under the broad definition of ESA, "take" of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. When "take" of a listed species is expected in the hatchery operation, *the ESA requires that a numerical estimate be quantified as best as possible.* To meet this objective, a "take table" is appended to the HGMP that, when completed for each hatchery program, will provide a uniform means to report estimated take (see Table 1) (emphasis added)."

The majority of HGMPs consistently report "unknown" for predation losses involving yearling salmonids and otherwise make no effort to estimate the likely numeric range of actual or potential take, nor do they attempt to explain why such estimates were not or could not be made. It is difficult to see how NMFS could credibly approve any HGMP that does not comply with Paragraph G of the Guidance without forcing the listed resource to bear the entire burden of the risk that arises due to the uncertainty of the *level* of take that is likely to occur from the various acknowledged risk factors related to hatchery practices.

Size of Overall Chinook Hatchery Program

The most ominous feature of this whole process is the sheer size of the overall hatchery program for Puget Sound chinook, especially when compared to reasonable estimates of juvenile wild fish production, totally and by river basin. There are minor differences in numbers between the RMP and individual HGMPs for Puget Sound chinook, but, for simplicity, we will refer to Table 4 (pages 17-19) of the former. This shows that the total hatchery program has a planned release of 45.603 million fingerling

chinook and 2.615 million yearling hatchery chinook. Our best guess is that total average annual production of juvenile "wild" chinook is less than seven million fish (fry plus fingerlings), with several million of these coming from hatchery origin parents, given the significant stray rates documented for Hood Canal streams and for most large river basins in Puget Sound. To us, it is inconceivable that this disparity between hatchery and wild fish production might *not* have a devastating impact on wild fish in terms of predation, competition, and reduced reproductive fitness.

Examined river basin by river basin, the picture becomes even more disconcerting. The Skagit system is the only place in the entire Puget Sound region where wild fish have a clear production advantage. Seiler et al. (2002a) show that the 12 year (1989-2000) annual production of wild fry and fingerlings averaged 2.8 million fish. This compares favorably with a relatively modest hatchery program planned for 672,000 fingerlings and 150,000 yearlings. From here, the situation deteriorates rapidly. Seiler et al. (2002b) estimated that the production of wild chinook fry and fingerlings from the Green River totaled 1.08 million fish in 2000. At least half were probably from hatchery fish parents. However, this is dwarfed by a hatchery program that plans to release 3.7 million fingerlings and 410,000 yearlings in the same system. We believe that the Snohomish system has a production of wild chinook fry and fingerlings comparable to the Green River (about 1.1 million fish with one-third from hatchery fish parents) but this is impacted by planned hatchery releases of 2.740 million fingerlings and 250,000 yearlings in the Snohomish system (including Tulalip Bay). Seiler et al. (2003) estimated that the Cedar River produced 81,000 wild chinook fry and fingerlings in 1999 and another 65,000 in 2000. In the same two years, they estimated that Bear Creek produced 15,000 and 32,000 wild chinook fry and fingerlings, respectively. However, this wild fish production in key Lake Washington tributaries is far below the planned hatchery releases of 2.265 million fingerlings.

The hatchery versus wild chinook disparity reaches an extreme in Hood Canal. The HGMPs for the area identify the Skokomish River as the primary producer of wild chinook fry and fingerlings but this is estimated to total only 104,400 fish per year (mainly from hatchery fish parents). The estimated total for all other Hood Canal streams was only 132,000 wild fish. Either of these numbers is but a tiny fraction of the planned hatchery releases in the same area - 7.0 million fingerlings and 475,000 yearlings. The situation is little better in the Elwha and Dungeness rivers where there are planned hatchery fingerling releases of 3.850 and 2.0 million fish, respectively. Both rivers certainly have wild fish production less than that estimated for the Skokomish (about 100,000 fish, mainly from hatchery fish parents). The Puyallup-White and Nisqually river systems may each produce a few hundred thousand wild chinook fry and fingerlings (with well over half from hatchery fish parents) but planned hatchery releases are 2.770 million fingerlings and 90,000 yearlings in the Puyallup-White and 4.0 million fingerlings in the Nisqually. The Nooksack and Stillaguamish River basins may have wild chinook fry and fingerling production similar to the Skokomish (about 100,000 fish). However, hatchery fish releases planned for Bellingham Bay tributaries total 5.8 million fingerlings and 100,000 yearlings. Even the modest 200,000 fish hatchery fingerling program in the Stillaguamish is probably at least double the wild fish production.

All of the indigenous chinook populations in Puget Sound appear to have current juvenile production that is far below their potential as a result of persistent inadequate adult spawning escapements (both in total numbers and in excessive proportions of hatchery origin fish). In two of 12 years, the Skagit River demonstrated the ability to produce six million wild fry and fingerlings but the average over this period was only 2.8 million (Seiler et al. 2002a). For comparative purposes, a relatively modest sized Washington coastal river basin of only 245 square miles (then without a hatchery), was estimated at the 95 percent confidence level to have produced between 1.8 and 4.0 million wild chinook fingerlings in 1972 (Wright et al. 1973).

We realize that hatchery chinook fingerlings will survive at significantly lower rates than wild chinook and that this will diminish the initial tremendous numerical advantages of hatchery fish over wild fish. However, this will be countered by the fact that numbers of wild chinook juveniles will include both fry and fingerlings, whereas hatchery fish are only fingerlings and these are significant larger than wild fingerlings. The fact that the hatchery fingerlings may survive less well over the entire life cycle in no way reduces the impact that they have in competition with wild fry and fingerlings before their premature death later in the life cycle.

In addition, there are 2.615 million hatchery chinook yearlings being released. These are not only considerably larger than wild fingerling chinook but survive at rates three or more times higher than hatchery fingerlings. Thus, these hatchery yearling chinook are the equivalent of 6 million or more hatchery fingerlings. We can see the net effect in adult returns in areas such as the Green River where it was recently estimated that 71% of the fish spawning naturally came from hatchery origin parents. These hatchery fish numbers must be over 90% in the Skokomish River and probably between 70 and 90% in the Nisqually and Puyallup rivers.

Violations of the Wild Salmonid Policy
Our use of the term "Wild Salmonid Policy" in this review refers to the combination of (1) Policy of Washington Department of Fish and Wildlife and Western Washington Treaty Indian Tribes Concerning Wild Salmonids plus (2) Additional Policy Guidance on Deferred Issues Concerning Wild Salmonid Policy. Both were adopted by the Washington Fish and Wildlife Commission on December 5, 1997, and together became the existing WDFW Wild Salmonid Policy. The first document is commonly but mistakenly referred to as the "joint policy" since it was never adopted by the Northwest Treaty Indian Tribes.

For a large number of important Puget Sound chinook populations, it is now being claimed that genetic extinction has already occurred and that indigenous populations no longer exist. These include the Puyallup, Mainstem Nooksack, Nisqually, and Skokomish rivers plus mid Hood Canal tributaries, northern Lake Washington tributaries and White River summer/fall chinook. Most of these areas were "hatchery management zones" for the past 25 years and the Wild Salmonid Policy clearly states that this practice must be eliminated in Washington. In many cases, there is conflicting evidence as to whether or not the genetic resources of indigenous populations still exist (these are described in detailed responses to individual HGMPs). We believe that responsible natural resource management requires assuming that these genetic resources still exist (until conclusively proved otherwise) and managing them accordingly.

A second obvious repeated violation of the Wild Salmonid Policy is with respect to the allowable percentages of hatchery fish on the spawning grounds (see Table 2, page 16 of the Additional Guidance). For a high level of similarity of hatchery fish, the maximum percent of the wild spawning population that is of hatchery origin should be 5 to 10%. For an intermediate level of similarity, the limit is 1 to 5%, while the limit for low similarity is 0 to 1%. The violations of this policy element are described in detailed responses to individual HGMPs. It seems obvious that the Skagit River will be the only basin in the entire Puget Sound ESU where chinook populations will come even close to meeting these policy limitations.

SPECIFIC HGMPs
WE have included in these general comments eleven individual sets of comments to the following HGMPs:

- Wallace River fall fingerlings
- Voights Creek fall fingerlings
- Soos Creek/Icy Creek yearling chinook
- Soos Creek fall fingerlings
- Rick's Pond yearling chinook
- Issaquah Creek summer fingerlings
- Hoodsport fall fingerlings
- Hood Canal yearling chinook
- George Adams fall fingerlings
- Soos Creek Coho Program
- Marblemount Winter Steelhead Program

The submitted reviews of the Wallace fingerling chinook, Voights Creek fingerling chinook, Soos Creek/Icy Creek yearling chinook, Soos Creek coho, and Marblemount winter steelhead programs

present detailed comments addressing and demonstrating the repeated, often redundant failure of the HGMPs to adequately address critical factors or provide sufficient information to meet the requirements of the HGMP Template.

These comments may appear to address directly only a small fraction of the HGMPs currently under review, and they do not directly address every section of the HGMP Template. However, the election of this review to not specifically comment on any individual HGMP or any HGMP-section describing specific hatchery practices should not be interpreted as approval of that HGMP or practice, or a disinclination to review it.

The Wallace, Voights, and Soos/Icy Creek chinook, the Soos Creek coho, and the Marblemount steelhead reviews demonstrate how virtually the same set of comments applies to the same evaluated sections of each HGMP. This pattern is repeated throughout the chinook and the coho/steelhead HGMP packages. The issues addressed in these five reviews are wholly representative of the deficiencies consistent throughout all of the HGMPs.

Our comments can be characterized by and large as requests to supply more detailed information to meet the requirements of the HGMP Template and the 4d Rule criteria for granting take authorization for hatchery operations, with some suggestions regarding the specific types of information requested. Substantively similar requests for equivalent information can be applied to most if not all of the individual HGMPs. Many HGMPs provide none of the information required in the cited sections of the Template. Some provide only partial information or at an inadequate level of detail. None of the HGMPs currently under public and agency review provide all the required information. Wherever applicable, the pertinent information should be considered requested for all of the HGMPs. Where in any other individual HGMP the responses to the specific sections cited in the Wallace chinook, Voight chinook, Soos/Icy chinook, Soos coho, and Marblemount steelhead reviews are substantively similar to those evaluated in those reviews, or fail to adequately provide the types of required information identified in those reviews, then those elements of our comments that can be reasonably applied to those responses should be considered as submitted comments to that individual HGMP, and should be responded to in the context of every applicable HGMP.

The Soos Creek fall fingerling, Rick's Pond yearling, Issaquah Creek summer fingerling, Hoodsport fall fingerling, Hood Canal yearling, and George Adams fall fingerling reviews present miscellaneous comments on other specific aspects of these representative HGMPs. Again, wherein other HGMPs these comments can be appropriately applied to similar responses to the same HGMP section, they should be considered as comments to those specific HGMPs, and responded to accordingly.

It should not be assumed, however, that the full breadth of our assessments will be contained in any individual review in this package. Some reviews address HGMP sections not covered in other reviews, and in some sections that are commonly reviewed, idiosyncrasies between individual HGMPs have provoked small but significant variations in comments, addressing specific aspects of the evaluated response.

Wallace Summer Fingerling Chinook Program HGMP
Comments submitted by Washington Trout
August 1, 2003
Prepared by
Nick Gayeski; Ramon Vanden Brulle

Section 1.5
The response is incomplete and fails to comply with NMFS' HGMP Completion Guideline E which is specifically referenced in the HGMP Template.

Section 1.7
Most importantly, no program goals or objectives are clearly articulated. The program is merely characterized with the single word "augmentation". No motivation is provided in regard to the following implicit fundamental questions: *Why is harvest augmentation an appropriate or valid goal? Why does it need to occur at the Wallace facility or even within the Snohomish River Basin?*

Elimination, reduction, or minimization of the risk of adverse impacts of the facility and of program activities on listed Chinook is not listed as a program goal, though it is implicitly considered as such later in the HGMP. This goal needs to be clearly stated and explained in appropriate detail in this section, essentially at the beginning of the HGMP.

Several critical assertions are made here in the attempt to describe features of the augmentation program that are simply unexplained and unsupported within the response. *How* does WDFW propose to provide NOR/HOR ratios on the spawning grounds using the 600,000 "mass marked" hatchery releases? What are the details of the monitoring plan that will provide that information? What modeling will provide an index using the DIT group for wild Chinook? How has it been proofed? How will WDFW analyze data on "catch contributions, run timing, total survival, migration patterns and straying into other watersheds?" What performance standards will those data be applied to, and how will WDFW respond to information provided by the data?

Section 1.8.
On its face, this response appears inappropriate, and would be better included in the response to SS 1.7. It describes two goals of the program, providing fish for harvest and minimizing "adverse genetic, demographic or ecological effects on listed fish", without providing justification for either. Why is it socially, economically, or biologically necessary, advisable, or even beneficial to provide fish for harvest using this program at this facility? Perhaps WDFW takes it for granted that providing fish for harvest is justification in itself, but NMFS should not have to when evaluating this program, nor, certainly, should the public.

There likely are several and varied justifications for providing fish for harvest. They should be listed and described in sufficient detail to be evaluated and weighed objectively against all direct and indirect take of listed species likely to occur as a result of the program.

Even taking for granted some general need for "fish for harvest" does not provide adequate justification for any particular program, including Wallace River Summer Chinook Fingerling. Presumably, "fish for harvest" can be provided in any number of ways at any number of places. This response should describe why it is necessary to produce chinook fingerlings for harvest at Wallace River under the specific protocols proposed – again, in order that such justification can be *weighed against* the risk of potential take that may occur, relative to other options, including discontinuing or scaling back the program.

Presumably, relative to take authorization, the standard of justification for an integrated harvest/augmentation program should be higher than for a recovery, preservation/conservation, or research program, or at least different. One should expect at best a very low level of biological "benefit"

from a harvest/augmentation program. Therefore, a relatively high level of social and/or economic "benefit" should be described in detail in order to justify any biological risks of the program to listed Puget Sound chinook. The description should include information about the social or political obligation for the program, identify affected stakeholders, explain the program's success at providing the expected benefits, and/or supply numerical estimates of the economic activity that can be directly attributed to program activities.

WDFW appears to assume one or both of two things: that because the existing Wallace River Fingerling Program predates the listing of Puget Sound Chinook, the "benefit" of raising fish for harvest at Wallace River has already been established, and should not require detailed explication; or that the assertion that the existing program will be run (or has been run) in order to "minimize adverse… effects on listed fish" is adequate to justify continuing the program. To be fair, guidance offered by NMFS in the HGMP template could be interpreted to imply as much. Nevertheless, Washington Trout considers both of these assumptions counterintuitive, and a misreading of both the spirit and the specific requirements of the 4d Rule and the HGMP template.

At any rate, the response lacks detail sufficient to assure that the program will result in "adverse genetic, demographic or ecological effects on listed fish" being contained within quantifiable limits that can reasonably be considered to be "safe." The mere assertion that the Department's intention is to "provide fish for harvest while minimizing adverse… effects on listed fish" is insufficient.

The HGMP Template provides guidance that directs applicants to describe, "*how* the program will be operated to provide fish for harvest while minimizing adverse effects on listed fish." (Emphasis added.) The WDFW response merely asserts that it *will* operate the program thus (in language lifted nearly verbatim from the template). In order to meet the HGMP requirement to adequately describe how WDFW will accomplish these goals, quantitative standards that provide clear threshold levels of potential adverse impact to be avoided need to be stated, and then clearly linked to quantitative monitoring variables.

To its credit, the response includes five distinct points describing aspects of program operations that are intended to reduce potential adverse impacts of the release of hatchery fingerlings on listed chinook. However, we believe that these points fail to include or refer to appropriate measurable quantitative standards and/or rely on dubious or unjustified assumptions about the sources of adverse impact and how they may best be minimized. Further, the fact that these points are repeated *verbatim* and without extensive case-specific qualifying information in nearly every HGMP suggests that they are a boilerplate substitute for thoughtful analysis.

In the context of the ESA it is insufficient merely to assert that program operations will endeavor to minimize adverse impacts to listed species. It is necessary to quantify the level of take likely to result from these operations; that is, it is necessary to quantify the amount of take that is expected to result when program operations are configured so as to produce a "minimal" level of impact. NMFS in its January 5, 2002 guidance document titled *Hatchery and Genetic Management Plan Template: Purpose, Applications, and Instructions,* clearly directs HGMP applicants to supply a "numerical estimate" of expected take from hatchery operations "as best as possible" (paragraph G).

Point #1 asserts that juveniles will be released as smolts to minimize time of emigration from freshwater to saltwater so as to minimize potential competition and predation on listed fish. This fails to address several relevant issues in sufficient detail. It ignores the issue of relative size between released hatchery smolts and wild conspecifics. Both competition and predation are dependent upon the relative sizes of the individuals involved and hatchery smolts are generally released at sizes significantly larger than wild juvenile conspecifics of the same age.

Both competitive ability and predation potential need to be explicitly considered in order to evaluate the extent to which the time of release and the duration of migration to saltwater of released hatchery fish may negatively impact wild listed juveniles. This requires, at a minimum, that the relative sizes of released hatchery smolts and wild listed juveniles be specified and then evaluated with respect to

potential levels of competition and predation. Moreover, it is important to specify the expected *distribution* of sizes of released hatchery smolts and of wild listed juveniles that may be affected by the released smolts and to specify the absolute numbers of hatchery releases relative to both the expected numbers of rearing and migrating listed juveniles and the capacity of the river basin for rearing listed juveniles.

It is inadequate to assume (or imply) that there is a single size (i.e., the mean size) of hatchery smolts at the time of release and that there is a single (mean) size of wild listed juveniles during the time of emigration of hatchery smolts. The respective distributions of sizes is needed in order to properly estimate the likelihood of competitive displacement and/or predation by hatchery smolts on wild listed juveniles during the period of freshwater emigration of released hatchery smolts.

Point #2 asserts that juveniles will be released after the usual time of emigration of wild chinook smolts in order to minimize potential adverse interactions. This implies a gross over-simplification of the temporal distribution of the migration of wild listed juveniles from freshwater to saltwater habitats. Recent data on the timing of wild juvenile chinook outmigration in mid-Puget Sound rivers gathered by the Department's own Wild Salmon Production Evaluation Unit (WSPE) (Seiler et al. 2001(a), 2001(b), 2001(c), 2002, and 2003) provides substantial evidence that wild juvenile chinook downstream migration generally occurs over a protracted period of time ranging from February to July. The majority of this data is noteworthy in displaying no pronounced mode in the timing of wild chinook outmigration. Rather, outmigration appears to be more or less continuous with several small modes scattered from mid-March to mid-June. This makes it extremely unlikely that hatchery smolt releases can be scheduled to occur "after the usual wild chinook emigration time" as asserted by point #2, unless hatchery releases occur in late July.

The response fails to acknowledge current work that strongly suggests hatchery and wild juvenile chinook are commingling in near-shore habitats in Puget Sound for significant periods of time before migrating to the open ocean, any attempt at temporal segregation during emigration from upstream, freshwater habitats notwithstanding. Early data from beach-seine and surface-trawl sampling in Skagit Bay in 2002 demonstrate that hatchery-marked and unmarked chinook juveniles of various age and size classes are present together in significant ratios throughout the spring, summer, and fall, in several types of estuarine and near shore habitats. Sampled hatchery-marked juveniles are mixed with unmarked juveniles in mean percentages ranging from 10% to nearly 60% from May through November (personal comm., Casey Rice, NMFS; 2003). Both hatchery-marked and unmarked fish-presence is consistent throughout these periods, but attempts to identify exact ratios of hatchery to wild juveniles are confounded by the fact that some hatchery juveniles released outside but nearby the study area are not visibly marked, and may be entering the study area during certain sampling periods, creating a possibility of undercounting hatchery juveniles during sampling. During the periods that hatchery and wild juveniles are present together in these near shore environments, the hatchery juveniles may enjoy several competitive advantages over their wild counterparts, including most significantly size, which may contribute to create a significant risk of adverse interactions and impacts to listed chinook, including competition, displacement, and predation. WDFW is aware of these preliminary findings and should understand their implications. These data should warrant some discussion and analysis in this context, insofar as WDFW is asserting that it can successfully minimize adverse impacts to listed Puget Sound chinook by effectively segregating wild and hatchery juveniles during freshwater out-migration and rearing life stages.

Point #3 asserts that straying of returning hatchery-origin (F1) adults will be minimized by acclimating released juveniles "at a hatchery facility capable of trapping the majority of returning adults." This assertion glosses over several critical issues and recent data indicating that straying of returning adult Wallace River Hatchery summer chinook in the Skykomish and Snoqualmie River Basins is significant.

The assertion that the Wallace Hatchery facility is capable of trapping the majority of returning adults is inappropriately vague in as much as it can be satisfied by trapping 51% of F1 adults returning to the hatchery trap, and would only apply in any case to those fish that entered the Wallace River on which the hatchery is located and migrated upstream as far as the trap. Even so, recent data demonstrates

that hatchery-origin fish spawning in the Wallace River has been considerable, indicating that significant numbers of hatchery fish that actually enter the Wallace River are not caught in the trap.

Importantly, no threshold target level of straying (maximum acceptable % hatchery-origin adults present on the spawning grounds with listed adult chinook) is mentioned, much less discussed, in this context. Specification of such a standard in conjunction with specification of a detailed plan for monitoring straying is essential if a hatchery program is to have the ability to identify adverse impacts on listed fish in a timely manner and contain them within biologically acceptable limits. Even this, however, is not enough. It is necessary in addition to specify the appropriate and timely management response that is to occur when the limit standard is exceeded.

Although the stringent Wild Salmonid Policy standard of 4% is subsequently listed in the Table of performance standards, indicators, and monitoring and evaluation in subsection 1.10 (pp. 3 – 6), no associated monitoring plan is subsequently described. Neither is there any description or discussion of any management responses that would be taken to correct violation of the limit standard in a timely, risk-averse manner.

We agree that the upper bounds on the acceptable percentage of hatchery-origin strays on natural spawning grounds should be set at those listed in the table on pp. 3 - 6 so as to comply with the Guidelines delimited in the Department's Wild Salmonid Policy Additional Guidance (Table 2, page 16). However, we suggest in addition that specific proportional reductions in hatchery releases be examined and delineated as responses to corresponding percentage-exceedence of the acceptable upper bound on straying.

Point #5 asserts that harvest rates on hatchery-origin adults from the program will be managed to allow for "adequate escapement of listed chinook". Absent a clear specification of what constitutes an "adequate" escapement of listed chinook this point contains no identifiable standard. In this context, a biologically credible numeric minimum escapement level is required. A clear quantitative standard is required so that hatchery managers, NMFS, and the interested public can tell whether or not the escapement observed in any year is "adequate". In addition, a clear specification of the management actions that will be taken when escapement fails to attain the desired minimum level should be provided.

This point also demonstrates the necessity for each HGMP and the associated Hatchery RMP to be clearly integrated with harvest management and planning. The issue raised here as well as other harvest-related issues should be discussed in considerable detail in Section 3.3 as specifically required by the HGMP Template. The HGMP needs to provide an appropriately detailed description of how harvest plans and objectives are to be modified on the basis of monitoring data acquired in connection with hatchery operations, and, conversely, how hatchery operations will be regularly assessed and modified as harvest plans and objectives are changed in response to the condition of listed chinook populations and management units so as to secure recovery of listed populations. The failure of this and every other HGMP we have examined to do this is a major deficiency of these attempts to demonstrate to NMFS and the public that 4(d) take exemptions should be issued to WDFW for the hatchery programs and facilities in question.

The response fails to describe *how* WDFW has determined that the assertions contained in each of these five points is true or likely to be true, or describe to what extent they are true. How does releasing juveniles as smolts minimize emigration time? How effectively does it achieve this objective? How effectively has WDFW's acclimation practices minimized straying? How will the practices proposed differ from past practices, if at all? The assumptions underlying the answers to these and other pertinent questions may be well known to WDFW, NMFS, and even some members of the interested public, but that cannot excuse their omission from a document intended for public review and analysis under the ESA.

Guidance from NMFS on completing the HGMP Template directs applicants to "cite relevant reports… or other analysis (sic) or plans that provide pertinent background information to facilitate evaluation of the HGMP," and to "provide additional support of critical information" submitted in the HGMPs. The

justification for the program would appear to be critical information, yet WDFW provides no citations or documentation to support the assertions made in the response.

In sum, it appears that the combined responses to SS 1.7 and SS 1.8 constitute no more than an *inadequate* response to SS 1.7. As a result SS 1.8 is essentially left *unanswered.* As noted above, without an adequately described *justification* for the program, there is virtually no way for federal regulators or the public to evaluate or weigh the potential risks of the program against any supposed benefits, regardless of the scope or probability of those risks. This shortcoming alone would appear to render this HGMP application inadequate for federal approval.

Sections 1.9 and 1.10
The Table on pages 3 - 6 listing performance standards, indicators, and Monitoring and Evaluation Plan in general either fail to be standards or indicators, or are stated at an inappropriate level of generality. We instance the following as examples.

"Produce adult fish for harvest" is not a *bone fide* standard, but at best is a program goal. A Performance Standard would be "produce an annual average of 10,000 adult fish age 3 to 5 for harvest by combined fisheries in Alaska, West Coast Vancouver Island, the Washington Coast, Strait of Juan de Fuca, and Puget Sound." A Performance Indicator corresponding to this standard might be "achieve an average annual release of 1,000,000 fingerling smolts with an annual mean survival rate of 1%." A Monitoring and Evaluation Plan for these standards and indicators would describe the methods by which catch will be monitored and survival rates estimated.

On page 4, "manage for adequate escapement" is a goal not a performance standard, and "hatchery and wild return rates" is not a performance indicator, but rather a statement of possible parameters that could serve as indicators and might be monitored. A performance standard here would be "manage annual release levels and associated harvest rates so as to achieve an average annual escapement of at least 6,000 natural origin (listed) adult spawners including at least 3000 females of which a maximum of 10% are three-year olds. In addition, manage release levels and harvest rates so that no more than 4 % of the total annual spawning population is composed of hatchery-origin adults." A performance indicator associated with such a standard might be "the minimum number of natural origin spawners observed in index reaches A,B, and C, are at least X,Y, and Z with a percentage of females age 4 and older of 90%". A corresponding Monitoring and Evaluation Plan would include a specification of index areas and frequency of spawner counts during the course of the spawning season together with a description of sample methods and associated sample sizes for estimating ages, sex ratios, and percentage of hatchery-origin fish.

On page 5, the remarks under the heading Monitoring and Evaluation Plan corresponding to the standard "Minimize interactions with listed fish through proper rearing and release strategies" contain no measurable criteria and no actions associated with attempts to measure impacts of hatchery releases on listed juveniles. Even the statement "CWT data and mark/unmarked ratios of adults" fails to specify a number for the ratio, much less how such a ratio is to be estimated and where and when it will be measured.

(It should be noted here that one of the “performance indicators” listed for this standard, “Out-migration timing of listed fish / hatchery fish, *unknown*/June” (emphasis added), seems to contradict one of the “justifications” listed for the program in SS 1.8. If the out-migration timing of listed wild chinook is unknown, it seems unlikely that hatchery managers can reasonably claim, let alone assure, that “juvenile chinook will be released after the usual wild chinook emigration time to minimize potential adverse interactions,” as stated in SS 1.8.)

None of the items listed under the heading Performance Indicator is clearly stated as an indicator nor is any one of them obviously relevant to the goal (not a standard) of minimizing adverse interactions with listed fish. A modicum of biologically relevant argumentation is required to make a case for the relevance of these items, and such argument has nowhere in this HGMP been made.

The associated Performance indicator of 70 fpp raises another important issue for this and all HGMPs. Fish-per-pound is hatchery management jargon and not clearly understood by the public. Moreover, where length is of direct relevance to issues such as predation and competitive interactions among conspecifics, number per pound cannot be directly translated into length or weight without specification of the condition factor of the released fish. We therefore recommend, first of all, that the Fulton condition factor, K (=W(grams)*100/(L(cm)^3) be reported together with both the number of fish per pound and the length in centimeters or millimeters that is associated with the number per pound at the given condition factor. Second of all, we recommend that the distribution of condition factor, length, and numbers per pound be provided for all hatchery releases discussed in the HGMP. Information about the size range of released hatchery juveniles in conjunction with the size distribution of rearing and migrating listed juveniles is critical in estimating the likely adverse impacts of hatchery releases.

Section 1.11.2.
The HGMP complies by listing in the table the total number of fingerlings to be released annually. While this complies with the letter of the HGMP template, it fails to provide either NMFS or the public with enough information to properly judge the scale of the hatchery releases and their potential direct and cumulative impact on listed fish in the river basin in which the releases occur and in the associated estuary and Puget Sound nearshore environments. Some sense of the scale of hatchery releases relative to the number of wild listed juveniles likely to be present in these environments during and shortly after the time of hatchery releases is required in order to adequately judge the size of the program and assess the potential contribution of the releases from specific programs and facilities to the cumulative impact of hatchery releases on listed fish.

We recommend that in addition to listing hatchery facility releases an estimate also be made of the total numbers (by species) of wild salmonid juveniles (listed and unlisted) that are expected to be rearing in and migrating through and out of the river basin in which the releases are planned to occur. We further recommend that the HGMP list estimates of the numbers of hatchery juveniles of each species of salmon that are expected to be migrating through and rearing in the nearshore of Puget Sound or Hood Canal between the mouth of the river on which the hatchery in question is located (or in which the hatchery releases occur) and the entrances to Hood Canal and Puget Sound and that these numbers be compared to estimates of cumulative numbers (by species) of wild juveniles. Only this kind of comparative data in addition to the numbers of juveniles proposed to be released by the facility for which the HGMP is written can provide NMFS and the public with the appropriate sense of the expected size of the program.

Section 1.12.
The HGMP provides a bare minimum of data as an answer to the narrow list of candidate indicators provided in the subheading (smolt-to-adult survival rates, adult production levels, and escapement levels). No discussion or analysis accompanies the data reported at the top of page 7. A smolt-to-adult survival rate for the 1985 brood year of 0.10% is given. No discussion accompanies this to indicate how this number is related to a performance standard or indicator, or even whether such a survival rate is acceptable, expected, or a matter of concern.

Escapements to the hatchery rack for broodyears 1995 to 2001 are listed. All are in excess of the broodtake goal of 900 pair stated on page 6, some considerably so. Nothing is said at this point concerning the disposition of the excess spawners. Both NMFS and the co-managers have acknowledged concern over high proportions of hatchery adults present on the spawning grounds with listed adults in the Skykomish River basin, including the Wallace River. The disposition of these surplus adults would appear to be of direct relevance to the description and assessment of program performance. Guidance offered by NMFS in the HGMP Template directs applicants to provide escapement data that includes escapement to the hatchery *and* natural areas (emphasis added) for the most recent 12 years. Data for escapement to natural areas are not provided, and the data provided cover only six years. Neither of these omissions are acknowledged or addressed.

We believe that more is required in addressing this subsection of the HGMP than has been provided, including a description of a monitoring and evaluation plan that has been (or will be) employed in

measuring program performance. Such a monitoring and evaluation plan should include features that monitor program impacts on listed fish. This will require clear statements of measurable performance standards and performance indicators. It will also require statements of appropriate management responses when specific threshold levels of indicators are attained (or fail to be attained, depending upon the manner in which the indicator is stated).

We suggest that the following be included in assessing program performance.

- Stray rates (% hatchery spawners present on spawning grounds with listed fish in specific subbasins): clear upper bounds that are in compliance with the Wild Salmonid Policy guidelines.
- The proportion that the annual number of released hatchery juveniles bears to the estimated annual number of listed conspecific juveniles within the river basin or subbasin where the hatchery releases occur: a clear upper bound combined with a scaling of the absolute number of hatchery juveniles released to the estimated juvenile freshwater carrying capacity of the basin.
- Hatchery smolt-to-adult survival rates, and wild smolt-to-adult survival rates: A lower limit to smolt-to-adult survival rates for hatchery fish should be established. Determination of an appropriate limit should include fitness considerations. Fitness considerations should include considerations of the long-term viability and productivity of the hatchery stock and considerations of the impacts on listed fish of interbreeding with hatchery strays at the upper acceptable level (specified under #1 above). A minimal, biologically acceptable lower limit on hatchery smolt-to-adult survival, however, cannot be purchased at the cost of significant size/condition differentials at the time of release between hatchery and listed juveniles. Limits (performance standards) need to be set on both the maximum size/condition differential between hatchery and listed juveniles and the minimum smolt-to-adult survival rate of hatchery juveniles. Both are required to assure that the program goal of minimizing adverse impacts on listed fish can be attained.

In addition, a minimum wild smolt-to-adult survival rate should be established that would be sufficient to insure the recovery and long-term persistence of local in-basin populations. Estimation of this rate should take into account the modal value of age-specific female fecundity, the adult population age-structure and sex ratio, the expected range and distribution of variation in survival rates between egg deposition and adult return, and expected harvest impacts. While the role hatchery releases may have in depressing wild smolt-to-adult rates may be unknown or controversial, it is certainly unexamined and un-monitored. Knowing whether and to what extent this may be occurring would appear to be essential to providing an acceptable evaluation of the performance of a hatchery program. This cannot occur without establishing a performance standard for wild smolt-to-adult survival.

Section 1.16.
The HGMP provides no answer whatever to this important question. This is a serious deficiency.

One of the program goals is to conduct hatchery operations so as to minimize potential adverse impacts on listed fish. Significant thought should be given to ways in which facility operations might be altered or other program goals modified so as to achieve the goal of minimizing potential adverse impacts. These should be enumerated and discussed here together with a statement of reasons for not adopting such changes. At a minimum considerable detail should be provided to support a claim that current operations and goals are sufficiently protective of ESA concerns.

We suggest that the following be considered among the kinds of changes that would better satisfy the goal of minimizing potential adverse impacts on listed fish. 1) reducing the proposed number of juveniles released until stray rates within the basin are reduced to within the Wild Salmonid Policy guidelines (as described in the Table in subsection 1.10); 2) changing rearing practices so as to produce juveniles that are similar in size and condition to wild conspecifics likely to be rearing in and migrating from the basin during the time of release; 3) within the limits of the facility, releasing juveniles over a more protracted period of time to more closely approximate the temporal distribution of wild juvenile migration, in order to avoid overwhelming wild juveniles with one large pulse of hatchery juveniles; 4) in combination with reducing or eliminating releases from the Wallace facility into the Snohomish River Basin, release fingerling Chinook reared at Wallace in other Puget Sound river basins lacking indigenous, listed Chinook populations.

NMFS' Template clearly requires that such alternatives be described and considered and "reasons why those actions are not being proposed" provided.

An obvious course of action in view of the nature of the program, the alleged and the largely unquantified benefits resulting from the program and the significant risks to listed chinook, is to reduce or eliminate the program altogether. It appears obvious that consideration of such an alternative in this section of the HGMP is mandatory.

Related to the alternatives of program reduction or elimination would be a consideration of how and whether habitat-management efforts could replace or augment hatchery production to meet some program goals at a lower level of biological risk. Efforts on the Skagit River provide an example for consideration. In 1980 and again in 1990, Seattle City Light (SCL) radically changed the operation of the Upper Skagit dams with increased commitments of flow to better accommodate salmon spawning and rearing. It is apparent there has been a shift of wild Skagit chinook production increasingly into that section upstream of Rockport.

Between 1974-1984 the percentage of the overall wild Skagit chinook population that spawned upstream of Rockport was 62%, between 1985-1993 it was 73%, and between 1094-2001 it was 78% (Connor and Pflug 2003). This sub-stock of chinook is the only one in the watershed that has remained in stable numbers in the period of spawning survey record between 1974-2001. For comparison, these same data indicate that the percentage of change in mean escapement between the 1974-1984 time period and the 1985-2001 time period was +3% for the Upper Skagit while it was -41% for the Lower Skagit and -52% for the Lower Sauk River, the major wild chinook spawning tributary to the Skagit. While the Upper Skagit wild chinook have remained stable, or increased slightly, the remaining basin has been in significant downward decline. From 1974-2001, the overall average wild Skagit chinook population escapement remained relatively stable: 1974-84 - 12,112; 1985-93 - 10,279; 1994-2001 - 11,526. Wild-chinook productivity for the population is being increasingly carried by the Upper Skagit.

Since 1980, SCL mitigation investments became increasingly focused on habitat acquisitions with related habitat protection, habitat restoration, or habitat re-creation projects (personal communication Dave Pflug 2000, 2001, 2002, per Bill McMillan, 2003). This contrasts with hydro electric dam mitigation for fish losses more commonly realized in the form of hatchery programs elsewhere. While Upper Skagit wild chinook have remained stable, the rest of the Skagit basin has remained in wild chinook decline at the same levels as other Puget Sound areas where habitat investments have most often been lower and hatchery domination commonly higher in those other river basins.

The Skagit system is the only place in the Puget Sound region where wild fish have a clear production advantage. Seiler et al. (2002a) show that the 12-year (1989-2000) annual production of wild fry and fingerlings averaged 2.8 million fish. This compares favorably with a relatively modest hatchery program planned for 672,000 fingerlings and 150,000 yearlings.

Evidence suggests that on the Skagit, where emphasis has been on moderation of hatchery chinook production, the result has been comparatively high wild fry and fingerling production. This credible alternative, with others, should be discussed and contrasted with the proposed alternative in this section, with a rationale for rejecting any. We do not believe that this HGMP can credibly qualify for take authorization without significant revision to this response.

It is worth noting that subsection 2.2.2 (pp.8-9) states that "[n]ew information indicates that there are substantial numbers of hatchery fish spawning in the wild with 30% to 50% of the spawners in the Skykomish River and approximately 10% in the Snoqualmie portion of the basin being of hatchery-origin". This considerably exceeds the 4% stray rate standard listed on page 4 and would clearly seem to require that the response to this section include careful consideration of options to immediately correct this situation.

Section 2.2.1

This response does not adequately address the guidance provided by NMFS in the HGMP Template. The response fails to describe, as directed by NMFS: “adult age class structure, sex ratio, size range, migrational timing, spawning range, and spawn timing; and juvenile life history strategy, including smolt emigration timing.” The response does not address, let alone emphasize, “spatial and temporal distribution relative to hatchery fish release locations and weir sites.”

None of this information could be considered incidental to evaluating whether hatchery operations at Wallace River are being managed to minimize adverse effects on Puget Sound chinook. The omission of this critical information is a serious shortcoming of a publicly reviewed application for take authorization. While it may be assumed that NMFS already has the requested information, without this information, the application lacks adequate transparency. If these data are unavailable, or inadequate for inclusion in the application, then serious questions arise about the appropriateness of the program at the proposed scope.

Section 2.2.2
Recent 12 year productivity and/or survival data. "1.358: 1 for 1990 to 1999" without further qualification is provided in response. Presumably this is a progeny-to-parent (adult recruit-to-spawner) ratio. But this is unclear in the absence of any explanatory comments and supporting data. The HGMP template explicitly asks for the source of these data.

In view of the acknowledged concerns regarding high levels of straying of Wallace hatchery stock within the Snohomish Basin, there is reason to suspect that adult recruit-to-spawner ratios for this period (prior to otolith and adipose clip marking) could be inflated by counting hatchery-origin spawners among the wild spawners. In any case, in the absence of a more thorough response to the question, the number provided is uninformative.

The same concern about counting hatchery-origin F1 adults among natural spawners exists for the figures provided for the most recent 12 year annual spawning abundance estimates. Only one of the 11 years of data provided (6304 for 1998) exceeded the spawning escapement goal for the Snohomish Basin of 5250, but even this figure is likely inflated by hatchery-origin adults. This suspicion is supported by the recent Draft of the updated Chinook Status Review by NMFS Biological Review Team ("Preliminary conclusions regarding the updated status of listed ESUs of West Coast salmon and steelhead A. Chinook salmon. February 2003. Co-manager review draft"). Figure A.2.4.1, page 45 shows approximately 1400 natural origin spawners among a total of approximately 1900 total spawners in 1998 in the Snoqualmie River and approximately 1600 natural origin spawners among a total of approximately 4400 total spawners in the Skykomish river, the two largest spawning areas in the entire Snohomish river basin. These two thus account for only 3000 natural origin spawners for 1998.

The HGMP simply fails to comment on the nature of the scant data provided and fails to discuss the implications of the data it has provided for understanding the current condition of the listed populations that may be affected by the release of juveniles from the hatchery. These failures are further disconcerting in view of the acknowledgement on page 9 that "[n]ew information indicates that there are substantial numbers of hatchery fish spawning in the wild…"

The third bulleted element of this subsection of the HGMP template includes a direction to "include estimates of juvenile habitat seeding relative to capacity or natural fish densities, if available." This direction is not addressed by the HGMP in question. As noted previously, it is essential that an accurate depiction of the scale of the hatchery releases relative to the production and capacity of listed fish in the basin be provided by each HGMP. A basic part of providing this scale is to estimate annual production of listed juveniles and to estimate the carrying capacity of the basin. The failure to do so is another significant shortcoming of this HGMP.

Section 2.2.3.
The response states, in part, that "[j]uvenile releases may cause unknown predation or competition risk to listed fish." The projected annual take levels are similarly described as simply "unknown". The

associated take table (Table 1) at the end of the HGMP (page 26) lists Unintentional lethal take of egg-fry, juvenile/smolt, and adults as "unknown".

No attempt is made to estimate the level of this suspected take, yet this is what is explicitly requested by NMFS in the HGMP Template and in the HGMP Completion Guidelines dated January 5, 2000. Guideline G is especially relevant:

“Under the broad definition of ESA, ‘take’ of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. When ‘take’ of a listed species is expected in the hatchery operation, the ESA *requires* that a numerical estimate be quantified as best as possible.” (emphasis added)

Merely listing "unknown" fails to qualify as providing a numerical estimate as best as possible.

Clearly, in the absence of case-specific data and adequate research there is considerable uncertainty to estimates of levels of take resulting from the factors enumerated under guideline G. However, this uncertainty neither excuses the HGMP from making a credible attempt to estimate take levels as required by NMFS, nor does the presence of uncertainty itself render it impossible for credible estimates to be made.

In the context of the ESA it seems clear to Washington Trout that when faced with genuine uncertainty as to a potential harmful effect of a hatchery practice -- resulting either from lack of data and lack of past research, or from uncertainty regarding biological mechanisms involved in potentially harmful inter- and intra-specific interactions -- when estimating the potential level of the harmful impact, assumptions be employed that risk over-estimating the level of take, rather than risk under-estimating it! In other words, the estimation process ought to be more concerned with providing reasonably high power (low probability of making a Type II error) than with keeping the probability of making a Type I error low for a null hypothesis that hatchery releases cause no take. The HGMP is simply more concerned with wrongly estimating a level of take from predation by hatchery smolts than it is with failing to guard listed juvenile chinook against the credible risk of take from predation by hatchery smolts. As with most of the numerous factors responsible for the decline and listing of salmonid populations under the ESA, the listed resource is forced to bear the full burden of the uncertainty.

We also note that while the information and techniques available to undertake to provide estimates of levels of take may not reside within the staff at the hatchery facility or program level, WDFW does have staff knowledgeable and practiced in risk assessment. We believe that such staff must be more directly engaged in these aspects of completing HGMPs. The NMFS Science Center can likewise provide support for these types of assessments and analyses. We recommend that WDFW enlist the Science Center’s assistance if necessary in making these critical assessments.

Subsection 2.2.3 asks the respondent to "[I]ndicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program." No answer whatever is provided in response.

This is both unsatisfactory and disturbing. Critical to successfully pursuing the program goal of minimizing adverse impacts on listed fish is the existence of clear measurable quantitative impact-containment objectives (performance standards and indicators) and a monitoring program committed to collecting and analyzing the requisite data. An inevitable feature of a *bone fide* impact monitoring and evaluation program is a set of contingency plans for responding to the exceedence of threshold levels of impact.

We recommend that the Department develop quantifiable impact-containment objectives related to risk of take of listed juveniles by hatchery operations due to behavioral modification, competition, and predation, among other elements listed in Guideline G. In addition, we recommend that the Department assign a team consisting of individuals with experience in risk assessment and in wild stock research to

work with individual hatchery managers in developing impact containment objectives, associated monitoring and research plans, and program responses to monitoring data that indicates that impact thresholds have been exceeded or are likely to be exceeded.

We believe any HGMP that presently lacks such a risk-based impact-containment program cannot credibly qualify for take authorization.

Section 3. Relationship of Program to Other Management Objectives.
In general the answers provided in this section of the HGMP are cursory and insufficiently detailed.

Section 3.1.
The HGMP fails to address the relation of planned program releases to the co-managers' Future Brood Document, yet this appears to be the principal document governing production levels and coordination of production levels and releases between WDFW hatchery facilities and tribal facilities. The relationship between production levels proposed in the Future Brood Document and risk to ESA-listed salmonid species in Puget Sound should be addressed in this subsection. As previously noted, we believe that the magnitude of juvenile releases from each hatchery facility needs to be compared to local, within-basin, rearing capacity of listed juveniles as well as to the total number of hatchery juvenile releases planned for the whole of Puget Sound and Hood Canal.

It does not seem possible to adequately describe or characterize either the magnitude of a particular juvenile chinook program or its relationship to other management objectives without providing a sense of the scale of the proposed hatchery releases relative to the total planned production of hatchery juveniles in Puget Sound and Hood Canal and relative to the estimated numbers of listed juveniles within river basins and within the estuary and nearshore environments of Puget Sound and Hood Canal. This is a serious shortcoming of the HGMP in question.

Similarly, hatchery production level objectives contained in the Future Brood Document are directly related to both the harvest component and the hatchery component of the Co-Managers' Joint Resource Management Plan for Puget Sound Chinook (RMP), which are intended to obtain ESA 4(d) Take protection under Take Limit 6. The Wallace fingerling HGMP is, in fact, essentially an attachment to the hatchery RMP. The relationship of proposed production levels and methods contained in this HGMP to these governing planning documents clearly requires to be discussed in this section of the HGMP.

WDFW's own Wild Salmonid Policy, adopted in 1997, provides clear performance standards and policy guidance for hatchery operations and practices throughout Washington State, including the whole of the Puget Sound chinook ESU. Since the listing of Puget Sound chinook in 1999, WDFW has repeatedly cited the WSP as a guiding document in its ESA-related recovery management. Yet no mention is made of the relationship or alignment of the hatchery program described in this HGMP with any particular performance standard or policy guidance in the WSP. Ample evidence suggests that current hatchery practices and operations, including practices and operations described in this and other HGMPs, are inconsistent with the WSP, as cited in Washington Trout's review of this and other HGMPs. The HGMP should describe the WSP standards and guidance, and discuss the relationship between this program and the WSP.

The Hatchery Scientific Review Group was mandated and funded by the US Congress to develop an independently reviewed scientific framework for evaluating and reforming hatchery practices in Washington, including the Puget Sound chinook ESU. The HSRG has issued two reports, detailing specific recommendations for changing hatchery operations throughout Puget Sound, and is nearing completion of a third report, detailing recommendations for Hood Canal. WDFW has worked closely with the HSRG and publicly declared support for the goals and specific recommendations of the HSRG. This section of the HGMP should discuss and describe the alignment of the HGMP to the HSRG recommendations.

Section 3.2.

The response states that "[p]roduction numbers and appropriate stocks to be used are also outlined in a Memorandum of Understanding (MOU) between the [Tulalip] tribe and WDFW (WDFW, 1997)." The MOU in question should be attached as an appendix to the HGMP. As noted under 3.1 above, the Future Brood Document and the two RMPs would appear to be directly relevant here as well, and are not mentioned.

Section 3.3.1
Subsection 3.3.1 of the HGMP template requests a description of "fisheries benefiting from the program" as well as "harvest levels and rates for program-origin fish for the last twelve years (1988-1999), if available." In response, it is asserted that program fish contribute to marine sport, commercial, and Tribal fisheries and an in-river sport fishery. This response is far too cursory.

In the context of the ESA and the listing status of Puget Sound chinook, it is the alleged benefits to fisheries of program releases that are being weighed against the myriad of risks to listed fish of hatchery operations. This is especially true in the case of isolated harvest programs such as the Wallace fingerling summer chinook program.

The HGMP template specifically requests data and detail to quantify an assertion that any particular hatchery program is providing such benefits. It is particularly important for an HGMP to note when data are lacking or inadequate to permit a reliable estimate to be made of the quantitative contribution of program fish to the fisheries that program releases are being targeted to benefit. When this is the case it would, further, seem necessary and appropriate for the HGMP to explain how the program proposes to address the problem of lack of data.

The cursory and inadequate response gives the impression that program managers believe either that it is obvious that the hatchery program provides fishery benefits that outweigh risks to listed stocks or the appropriate default presumption is that a hatchery program provides such benefits until proven otherwise. In the context of the ESA this is decidedly not the appropriate presumption. To the contrary, the HGMP process and NMFS would appear to be requesting that quantitative evidence be provided of the fishery benefits actually provided by a particular hatchery program. The HGMP patently fails to provide this evidence.

Further, the response fails completely to address the guidance in the HGMP Template that directs the applicant to explain how or if artificial production and harvest management have been integrated.

Section 3.4
The HGMP provides no response. The HGMP Template provides the following guidance: "Describe the major factors affecting natural production (if known). Describe any habitat protection efforts, and expected natural production benefits over the short- and long-term."

This subsection clearly is requesting an estimation of freshwater and estuary juvenile rearing capacity and current wild, listed, juvenile production. It is also asking for a description of major limiting factors to natural production and capacity as well as for local and regional efforts to redress limiting factors. In addition, it is requesting that an assessment of the efficacy of such efforts be made.

All of these are relevant to characterizing the scale of hatchery releases and to assessing the relationship of these releases to the recovery of the listed species. As we have repeatedly noted in these comments, the minimal starting point for such an assessment is an estimate of current juvenile production and capacity of the basin.

At least one objective of this subsection is to weigh the appropriateness of the hatchery program against the current and expected natural productivity of the affected watershed. How badly is this harvest augmentation program needed? Is the listed population capable of accommodating the biological risks imposed by the program? How long might it be necessary to tolerate those risks? Omitting this information from the HGMP leaves these and other important questions unanswered.

With regards to habitat protection efforts, the Snohomish River Basin is the focus of a number of habitat assessment, restoration, and protection initiatives in which WDFW staff have been regularly involved. This is a data-rich basin with respect to all of these matters. We can think of no good reason for this subsection having been left blank in this regard.

Section 3.5.
The response references "WDFW Risk Assessment, 2000" in regards to risks to listed juveniles from predation and competition by hatchery juveniles. Predation risks are considered to be "low" and risks of competition "high". These terms are uninformative in the absence of further explanation. The "WDFW Risk Assessment, 2000" should be attached to the HGMP as an appendix.

Further, merely noting that a risk is "low" or "high" does not suffice to determine whether or not the risk is acceptable or unacceptable. In the context of ESA and Section 4(d) take issues, what is relevant is whether or not the level of risk rises to that of take. It is obvious that neither the public nor NMFS can determine this from the simple response provided. This response is clearly inadequate.

Section 4.1. The response states that the “facility is covered under NPDES permit # WAG 133006.” This response is woefully incomplete, in view of the fact that the NPDES permitting process only requires Total Suspended Solids and Turbidity levels to be explicitly addressed. There are a host of water quality and quantity parameters that can be impacted by hatchery facility location and operations and that need to be addressed at this point by the HGMP.

Moreover, again the HGMP simply ignores the basic issue of describing the water source and water quality profile as requested in the Template. The HGMP should describe the basic physical, chemical, and biological parameters that affect water quality that are regularly measured at the facility and in the receiving stream upstream of the hatchery facility and immediately downstream of hatchery discharge points. The frequency with which such measurements are made and the hatchery activities associated with such measurements (such as the disinfection of holding ponds) should be described. The HGMP should explain the reasons as to why any basic water quality or quantity parameter is not regularly measured.

In addition, the results of water quality inspections, including violations under the terms of the NPDES permit, should be described and explained. If the facility has received no citations for water quality violations this should be reported as well. It should also be reported if no inspections for compliance with the NPDES permit have ever been made.

Section 4.2
The response merely addresses facility water intake screens, and in regard to the screen on the May Creek intake only states that the screen “is believed to be compliant.” At a minimum, quantitative evidence in support of this belief should be described/cited.

The response simply fails to address effluent discharge, as requested in the HGMP Template. Relevant issues regarding effluent discharge that should be addressed in this subsection include the following: stream temperature upstream of the hatchery facility and intake, stream temperature at the points at which the facility discharges water and/or effluent to the receiving stream and at a point immediately downstream of identified and permitted mixing zones. Such mixing zones should be explicitly identified and described.

Times at which temperature, physical qualities such as turbidity, and chemicals and water chemistry parameters such as disinfectants, antibiotics, and nitrates levels in receiving waters are measured should be described. In particular, discharges associated with regular hatchery activities such as cleaning of holding ponds should be described and the kinds of measurements taken and the times which they are taken should be described.

Risk avoidance and containment measures associated with all identified discharges and water quality parameters monitored should be described in detail as well. Reasons should be given for not monitoring any such reasonable measure of water quality in receiving waters. The response is inadequate in all of these respects.

Section 6.2.3
The HGMP states “Past levels of natural broodstock in the hatchery population are unknown. WDFW shall investigate the feasibility of incorporating summer Chinook returning to Sunset Falls into the hatchery broodstock. The Sunset Falls fish making up to 10% of the broodstock.” Not only should the feasibility of doing this be investigated. The reasons for considering this measure should be stated and the *advisability* of doing so should be discussed. This measure raises important issues of mining listed spawners in a basin whose wild Chinook escapement is admitted to have been seriously compromised by hatchery straying for well over a decade (based upon the data reported in section 2.2.2 noted above).

Presumably this measure is being considered out of concern over domestication selection and/or inbreeding depression of the hatchery broodstock. Such issues should be explicitly noted and discussed in the HGMP. Again, if risks to the listed population are acknowledged in connection with this measure, alternatives measures with less potential risk to the listed population need to be considered in Section 1.16.

Section 7.2
The HGMP states on page 14 that beginning in 2004 “only marked adult fish volunteering to the Wallace River Trap will be used to meet hatchery requirements/ Unmarked fish *or marked fish in excess of hatchery needs* will be returned to the river to spawn naturally (emphasis added).” This raises several concerns. First, in view of the admitted and undesirable high level of straying within the Snohomish River Basin and particularly within the Skykomish River subbsasin in which the Wallace hatchery is located, the deliberate return of marked hatchery-origin adults to the river to spawn naturally is not only ill-considered, but appears to rise to the level of take itself. At a minimum, NMFS would appear to require that a quantitative estimate be made of the numbers of such hatchery-origin spawners that would be spawning naturally as a result of this particular practice and the numbers of listed spawners that these hatchery fish would likely encounter on the spawning grounds and the numbers that they would likely end up spawning with. Again, alternatives to this practice require to be explicitly considered, described, and discussed under section 1.16.

Second, this appears to directly contradict the statement in subsection 6.2.3 discussed above of incorporating 10% natural-origin fish from Sunset Falls into the annual hatchery broodstock.

Section 9.2.1
Average program performance data is requested. No response is provided and no explanation for the absence of a response is provided.

Section 9.2.4
The HGMP Template requests information regarding *average program performance*, including "length, weight, and condition factor data collected during rearing." (emphasis in the original). In response, the HGMP merely states the frequency with which "sampling" (unqualified) occurs in relation to fish size measured in numbers per pound. This is clearly inadequate. It does not provide quantitative details on average performance of the requested variables.

Section 9.2.10
The HGMP Template indicates that information regarding risks of domestication as well as competition and predation is requested. The HGMP provides no response and no explanation for the absence of a response.

This is a serious omission. It is difficult to predict how NMFS could grant an exemption from the 4(d) take prohibition to a hatchery facility or program that cannot articulate the manner by which it proposes to

conduct its program so as to assure a high probability of keeping adverse impacts to listed stocks below an acceptable minimum.

A minimally adequate response to this subsection would include a list of hatchery rearing and release practices that are intended to keep potential adverse impacts below a threshold level, a statement of the threshold level(s) and a list of measurable performance indicators relevant to the estimation of adverse impacts, and a statement of the monitoring plan that will be employed to measure the indicators in a timely manner and a statement of management actions that will be taken should monitoring indicate that threshold levels of impact have been attained. We suggest that such details be developed and provided.

Section 10
It is stated that the program goal is to release 1,000,000 fish at 70 to the pound. "A coefficient of variance of 8 or less is desired". This latter must be in error; perhaps 8% is intended or standard deviation in fish-per-pound which would be equivalent to a coefficient of variation of 8/70 or 11.4%. This should be corrected.

In addition, numbers of fish per pound is an insufficient quantity to report with regard to assessing potential deleterious impacts on listed fish. The mean and distribution of condition factor (Fulton's K) and length should be reported in addition to numbers per pound.

Section 10.4
It is stated that the June timing of fingerling releases is intended to "reduce interactions with wild fish." The matter of empirical evidence and related supporting reasons for this assumption should be addressed here as well. It needs to be transparent to reviewers whether this assertion is based upon or supported by basin-specific evidence or not; and if not, on what basis the assertion/assumption is being made.

As noted in comments on the response to SS 1.8, NMFS guidance directs applicants to provide citation and documentation to support critical information provided in the HGMP. No report or other documentation is provided to support the assertion that releasing fingerlings in June from Wallace River will “reduce interactions with wild fish” below any acceptable level. This is particularly distressing given the admission in SS 1.10 (p.5) that the emigration timing of wild chinook juveniles is “unknown.”

The expected numbers of migrating and rearing wild juveniles needs to be reported together with their size distributions and the temporal distribution of wild outmigration in order to provide a more complete picture of the potential for negative interactions between released hatchery and wild juveniles to occur. All such features are relevant to an assessment of the potential for interactions of several kinds to occur between groups of fish. These features need to be addressed and related to a credible estimate of the potential level of take of listed fish that is likely to result from the proposed releases. The response provided by the HGMP is inadequate.

Section 10.11
The response provided in the HGMP is merely a reiteration of the response provided under subsection 10.4. For the reasons stated in regards to that response the response in this subsection is inadequate for the estimation of the risk of take of listed fish that will result from the proposed releases. Again, no citation or documentation is offered to support the critical assertion made in this response.

Section 11.1
As discussed in relation to sections 1.9 and 1.10 there are no *bone fide* performance standards and indicators described in the HGMP around which a clear monitoring and evaluation plan could be structured. The response in this subsection is restricted to asserting that production groups of released hatchery fish will bear one or more of several kinds of marks that will enable them to be identified in fisheries and on the spawning grounds.

At best this marking will create a *potentia*l for monitoring impacts of hatchery fish on wild fish, particularly in regards to straying onto the spawning grounds of natural origin fish. A monitoring and evaluation plan,

however, should set impact-containment objectives for the measurement of which specific marks are relevant. Specific ranges or levels of impact of concern need to be explicitly stated (as quantitative performance standards), the means and manner by which such levels will be estimated identified using measurable quantities (performance indicators) and a range of management responses to various measured levels of each indicator identified. In brief, no monitoring plan has been identified and described, and no standards have been specified against which the results of monitoring could be *evaluated.*

Section 11.1.2
This response refers to the August 2002 *Joint RMP for Puget Sound Chinook Salmon Hatcheries*. This is the only reference to the RMP found by this review in the HGMP, even though Section 3 of the HGMP Template specifically directs applicants to identify the relationship and alignment of the specific program to other ESU-wide management objectives or plans. The relationship and alignment of this hatchery program to the RMP needs to be described.

Section 11.2
The response simply asserts without any subsequent explanation that monitoring and evaluation "will be undertaken in a manner which does not result in an unauthorized take of listed chinook." This is grossly inadequate. It is, furthermore, a considerable exaggeration based upon the lack of substantive performance standards, indicators, and impact targets in the preceding sections of the HGMP. Of course, it is first necessary that a monitoring and evaluation plan be in place and be described in sufficient detail before one is in position to assert that the activities directly associated with monitoring activities themselves will not cause take. As previously noted, no monitoring and evaluation plan of sufficient detail for this purpose has been evidenced for this program by the HGMP.

Conclusion
The HGMP simply provides no reason to believe that unacceptable levels of take of listed species will not occur as a result of hatchery operations proposed and described therein. The HGMP quite simply commits to NO readily identifiable, measurable performance standards or indicators whatsoever. Nor does it identify alternative management actions that will or might be undertaken in light of the evaluation of the results of a clear quantitative monitoring program.

The intent of the HGMP Template and process would appear to be to evaluate several broad factors -- among which are: the justification for a particular hatchery program; the current state of the affected listed population; the potential for the program to take listed species, including a credible quantitative estimate of the level of the potential take, and the measures proposed by the program proponents to minimize that take (including a credible quantitative estimate of the expected extent of the resulting reduction in potential take and the ongoing monitoring and evaluation of those measures) -- and to weigh these factors against each other in order to determine if take authorization is warranted. In general, the responses provided to individual queries in the Template are cursory, lacking in sufficient detail, and often inappropriate.

The justification for the program is at best inadequately described. In Table 1, attached to the HGMP application, the level of unintentional take at all three life stages is listed as simply “unknown,” despite NMFS guidance requiring applicants to provide a “numerical estimate” of expected take levels. Measures to minimize take are either inadequately described or based on assertions left unsupported by any documentation. Likewise, the description of proposed methods for monitoring and evaluating those measures are unacceptably vague, at best.

Given these significant shortcomings, this review finds it nearly impossible to even evaluate the particulars of the proposed program. We find the application itself apparently inadequate to justify take authorization under the criteria enumerated in the 4d Rule. We are compelled to suggest that WDFW withdraw the application and redraft it, if it can provide the necessary information. If the necessary information is unavailable at this time, we suggest that WDFW reconsider the program, either discontinuing it or significantly scaling it back until it can provide pertinent, credible information adequate to warrant take authorization.

Note:
Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

Voights Creek Fall Fingerling Chinook Program HGMP
Comments submitted by Washington Trout
August 1, 2003
Prepared by
Nick Gayeski; Ramon Vanden Brulle

Section 1.8
On its face, this response appears inappropriate, and would be better included in the response to SS 1.7. It describes two goals of the program, providing fish for harvest and minimizing "adverse genetic, demographic or ecological effects on listed fish", without providing justification for either. Why is it socially, economically, or biologically necessary, advisable, or even beneficial to provide fish for harvest using this program at this facility? Perhaps WDFW takes it for granted that providing fish for harvest is justification in itself, but NMFS should not have to when evaluating this program, nor, certainly, should the public.

There likely are several and varied justifications for providing fish for harvest. They should be listed and described in sufficient detail to be evaluated and weighed objectively against all direct and indirect take of listed species likely to occur as a result of the program.

Further, taking for granted some general need for "fish for harvest" provides no kind of justification for any particular program, including Voights Creek Chinook Fingerlings. Presumably, "fish for harvest" can be provided in any number of ways at any number of places. This response should describe why it is necessary to produce chinook fingerlings for harvest at Voights Creek under the specific protocols proposed – again, in order that such justification can be *weighed against* the risk of potential take that may occur, relative to other options, including discontinuing or scaling back the program.

Presumably, relative to take authorization, the standard of justification for an integrated harvest/augmentation program should be higher than for a recovery, preservation/conservation, or research program, or at least different. One should expect at best a very low level of biological "benefit" from a harvest/augmentation program. Therefore, a relatively high level of social and/or economic "benefit" should be described in detail in order to justify any biological risks of the program to listed Puget Sound chinook. The description should include information about the social or political obligation for the program, identify affected stakeholders, explain the program's success at providing the expected benefits, and/or supply numerical estimates of the economic activity that can be directly attributed to program activities.

WDFW appears to assume one or both of two things: that because the existing Voights Creek Fingerling Program predates the listing of Puget Sound Chinook, the "benefit" of raising fish for harvest at Voights Creek has already been established, and should not require detailed explication; or that the assertion that the existing program will be run (or has been run) in order to "minimize adverse… effects on listed fish" is adequate to justify continuing the program. To be fair, guidance offered by NMFS in the HGMP template could be interpreted to imply as much. Nevertheless, Washington Trout considers both of these assumptions counterintuitive, and a misreading of both the spirit and the specific requirements of the 4d Rule and the HGMP template.

At any rate, the response for this subsection of the HGMP lacks detail sufficient to assure that the program will result in "adverse genetic, demographic or ecological effects on listed fish" being contained within quantifiable limits that can reasonably be considered to be "safe." The mere assertion that the Department's intention is to "provide fish for harvest while minimizing adverse… effects on listed fish" is insufficient.

The HGMP Template provides guidance that directs applicants to describe, "*how* the program will be operated to provide fish for harvest while minimizing adverse effects on listed fish." (Emphasis added.) The WDFW response merely asserts that it *will* operate the program thus (in language lifted nearly verbatim from the template). In order to meet the HGMP requirement to adequately describe how

WDFW will accomplish these goals, quantitative standards that provide clear threshold levels of potential adverse impact to be avoided need to be stated, and then clearly linked to quantitative monitoring variables.

To its credit, the response includes several distinct points describing aspects of program operations that are intended to reduce potential adverse impacts of the release of hatchery fingerlings on listed chinook. However, we believe that these points fail to include or refer to appropriate measurable quantitative standards and/or rely on dubious or unjustified assumptions about the sources of adverse impact and how they may best be minimized. Further, the fact that these points are repeated virtually *verbatim* and without adequate case-specific qualifying information in nearly every HGMP suggests that they are a boilerplate substitute for thoughtful analysis.

In the context of the ESA it is insufficient merely to assert that program operations will endeavor to minimize adverse impacts to listed species. It is necessary to quantify the level of take likely to result from these operations; that is, it is necessary to quantify the amount of take that is expected to result when program operations are configured so as to produce a "minimal" level of impact. NMFS in its January 5, 2002 guidance document titled *Hatchery and Genetic Management Plan Template: Purpose, Applications, and Instructions,* clearly directs HGMP applicants to supply a “numerical estimate” of expected take from hatchery operations “as best as possible” (paragraph G).

Point #1 of the HGMP repeats the boilerplate assertion that “[j]uvenile chinook will be released after the usual wild chinook emigration time to minimize potential adverse interactions.” This fails to address several relevant issues in sufficient detail. It ignores the issue of relative size between released hatchery smolts and wild conspecifics. Both competition and predation are dependent upon the relative sizes of the individuals involved and hatchery smolts are generally released at sizes significantly larger than wild juvenile conspecifics of the same age.

Both competitive ability and predation potential need to be explicitly considered in order to evaluate the extent to which the time of release and the duration of migration to saltwater of released hatchery fish may negatively impact wild listed juveniles. This requires, at a minimum, that the relative sizes of released hatchery smolts and wild listed juveniles be specified and then evaluated with respect to potential levels of competition and predation. Moreover, it is important to specify the expected *distribution* of sizes of released hatchery smolts and of wild listed juveniles that may be affected by the released smolts and to specify the absolute numbers of hatchery releases relative to both the expected numbers of rearing and migrating listed juveniles and the capacity of the river basin for rearing listed juveniles.

It is inadequate to assume that there is a single size (i.e., the mean size) of hatchery smolts at the time of release and that there is a single (mean) size of wild listed juveniles during the time of emigration of hatchery smolts. The respective distributions of sizes is needed in order to properly estimate the likelihood of competitive displacement and/or predation by hatchery smolts on wild listed juveniles during the period of freshwater emigration of released hatchery smolts.

The response fails to acknowledge current work that strongly suggests hatchery and wild juvenile chinook are commingling in near-shore habitats in Puget Sound for significant periods of time before migrating to the open ocean, any attempt at temporal segregation during emigration from upstream, freshwater habitats notwithstanding. Early data from beach-seine and surface-trawl sampling in Skagit Bay in 2002 demonstrate that hatchery-marked and unmarked chinook juveniles of various age and size classes are present together in significant ratios throughout the spring, summer, and fall, in several types of estuarine and near shore habitats. Sampled hatchery-marked juveniles are mixed with unmarked juveniles in mean percentages ranging from 10% to nearly 60% from May through November (personal comm., Casey Rice, NMFS; 2003). Both hatchery-marked and unmarked fish-presence is consistent throughout these periods, but attempts to identify exact ratios of hatchery to wild juveniles are confounded by the fact that some hatchery juveniles released outside but nearby the study area are not visibly marked, and may be entering the study area during certain sampling periods, creating a possibility of undercounting hatchery juveniles during sampling. During the periods that hatchery and

wild juveniles are present together in these near shore environments, the hatchery juveniles may enjoy several competitive advantages over their wild counterparts, including most significantly size, which may contribute to create a significant risk of adverse interactions and impacts to listed chinook, including competition, displacement, and predation. WDFW is aware of these preliminary findings and should understand their implications. These data should warrant some discussion and analysis in this context, insofar as WDFW is asserting that it can successfully minimize adverse impacts to listed Puget Sound chinook by effectively segregating wild and hatchery juveniles during freshwater out-migration and rearing life stages.

Point #2 of the HGMP makes the following statement: “All juvenile chinook released will be acclimated at a hatchery facility that is potentially capable of trapping the vast majority of returning adults. Currently, the weir at this facility is only marginally functional and fish must voluntarily enter the hatchery pond. WDFW has requested funding to rebuild the adult trap and holding pond to maximize trapping efficiency and minimize straying and make possible the removal of hatchery fish from the naturally spawning population.” This is not a “justification” for the program in question! It is an admission of a problem that directly affects the potential level of take of listed fish by the program. As such it should be addressed in sections 1.16 and 2. It is not.

It is not at all clear what the relevance of the qualification “potentially” in the first sentence of the passage quoted is. The HGMP should specify the numbers of returning adults that the facility would be capable of trapping if properly configured, the period of time that is likely to elapse before this might occur, and the level of straying that is likely to result as a direct consequence of the facility’s *present* inability to trap the *majority* of returning adult hatchery-origin fish.

Apart from these issues, the statement suggests an unrealistic potential technical capability to trap “the vast majority of returning adults”. We believe that it is very unrealistic to think that any fall chinook program will be capable of doing this. It does not happen anywhere else. At best this claim about potential trapping efficiency is controversial and clearly in need of documented support. Due to the large size of the program (1.6 million juvenile fish released), there is a high probability that there will be excessive numbers of hatchery fish on the spawning grounds in violation of the Wild Salmonid Policy. This concern requires to be addressed in section 1.16.

Point #4 asserts that harvest rates on hatchery-origin adults from the program will be managed to allow for "adequate escapement of listed chinook". Absent a clear specification of what constitutes an "adequate" escapement of listed chinook this point contains no identifiable standard. In this context, a biologically credible numeric minimum escapement level is required. A clear quantitative standard is required so that hatchery managers, NMFS, and the interested public can tell whether or not the escapement observed in any year is "adequate". In addition, a clear specification of the management actions that will be taken when escapement fails to attain the desired minimum level should be provided.

This point also demonstrates the necessity for each HGMP and the associated Hatchery RMP to be clearly integrated with harvest management and planning. The issue raised here as well as other harvest-related issues should be discussed in considerable detail in Section 3.3 as specifically required by the HGMP Template. The HGMP needs to provide an appropriately detailed description of how harvest plans and objectives are to be modified on the basis of monitoring data acquired in connection with hatchery operations, and, conversely, how hatchery operations will be regularly assessed and modified as harvest plans and objectives are changed in response to the condition of listed chinook populations and management units so as to secure recovery of listed populations. The failure of this and every other HGMP we have examined to do this is a major deficiency of these attempts to demonstrate to NMFS and the public that 4(d) take exemptions should be issued to WDFW for the hatchery programs and facilities in question.

The response fails to describe *how* WDFW has determined that the assertions contained in each of these points is true or likely to be true, or describe to what extent they are true. How does releasing juveniles as smolts minimize emigration time? How effectively does it achieve this objective? How effectively has WDFW’s acclimation practices minimized straying? How will the practices proposed differ

from past practices, if at all? The assumptions underlying the answers to these and other pertinent questions may be well known to WDFW, NMFS, and even some members of the interested public, but that cannot excuse their omission from a document intended for public review and analysis under the ESA.

Guidance from NMFS on completing the HGMP Template directs applicants to "cite relevant reports… or other analysis (sic) or plans that provide pertinent background information to facilitate evaluation of the HGMP," and to "provide additional support of critical information" submitted in the HGMPs. The justification for the program would appear to be critical information, yet WDFW provides no citations or documentation to support the assertions made in the response.

In sum, it appears that the combined responses to SS 1.7 and SS 1.8 constitute no more than an *inadequate* response to SS 1.7. As a result SS 1.8 is essentially left *unanswered.* As noted above, without an adequately described *justification* for the program, there is virtually no way for federal regulators or the public to evaluate or weigh the potential risks of the program against any supposed benefits, regardless of the scope or probability of those risks. This shortcoming alone would appear to render this HGMP application inadequate for federal approval.

Section 1.10

"Out-migration timing of listed fish/hatchery fish, being determined/mid-May to early June". There is good reason to believe that there will be a wild chinook fingerling migration in May and June such as that observed in the nearby Green River (Seiler et al. 2002b) and this should be assumed for the Puyallup system as well. The wild fish and hatchery fish will definitely be in a direct competition situation in freshwater, estuary and near shore marine habitats. The risk requires to be acknowledged and addressed with a detailed quantitative monitoring and evaluation plan. The level of potential take resulting from this overlap should be estimated and should be the subject of discussion under section 1.16.

Section 1.11.2

The HGMP complies by listing in the table the total number of fingerlings to be released annually. While this complies with the letter of the HGMP template, it fails to provide either NMFS or the public with enough information to properly judge the scale of the hatchery releases and their potential direct and cumulative impact on listed fish in the river basin in which the releases occur and in the associated estuary and Puget Sound nearshore environments. Some sense of the scale of hatchery releases relative to the number of wild listed juveniles likely to be present in these environments during and shortly after the time of hatchery releases is required in order to adequately judge the size of the program and assess the potential contribution of the releases from specific programs and facilities to the cumulative impact of hatchery releases on listed fish.

We therefore recommend that in addition to listing hatchery facility releases an estimate also be made of the total numbers (by species) of wild salmonid juveniles (listed and unlisted) that are expected to be rearing in and migrating out of the river basin in which the releases are planned to occur. We further recommend that the HGMP list estimates of the numbers of hatchery juveniles of each species of salmon that are expected to be migrating through and rearing in the nearshore of Puget Sound or Hood Canal between the mouth of the river on which the hatchery in question is located (or in which the hatchery releases occur) and the entrances to Hood Canal and Puget Sound and that these numbers be compared to estimates of cumulative numbers (by species) of wild juveniles. Only this kind of comparative data in addition to the numbers of juveniles proposed to be released by the facility for which the HGMP is written can provide NMFS and the public with the appropriate sense of the expected size of the program.

Section 1.12.

The HGMP claims that no recent data is available to answer the narrow list of candidate indicators provided in the subheading (smolt-to-adult survival rates, adult production levels, and escapement levels). The response appears to imply that data will be forthcoming utilizing marked and coded-wire

tagged releases to “measure survival and stray rates of this program.” However no discussion accompanies this implication to indicate how or even if data from these releases will be gathered, analyzed, or utilized in relation to any program performance standards or indicators.

Escapements to the hatchery rack for broodyears 1995 to 2001 are listed. All are in excess of the broodtake goal of 1,100 adults stated on page 6, some considerably so. Nothing is said at this point concerning the disposition of the excess spawners. Since high proportions of hatchery adults present on the spawning grounds with listed adults is an acknowledged concern of the co-managers and NMFS the disposition of these surplus adults would appear to be of direct relevance to the description and assessment of program performance. Guidance offered by NMFS in the HGMP Template directs applicants to provide escapement data that includes escapement to the hatchery *and* natural areas (emphasis added) for the most recent 12 years. Data for escapement to natural areas are not provided, and the data provided cover only six years. Neither of these omissions are acknowledged or addressed. Likewise, the SS heading directs applicants to indicate the source of data provided, yet no sources are provided.

We believe that more is required in addressing this subsection of the HGMP than has been provided, including a description of a monitoring and evaluation plan that has been (or will be) employed in measuring program performance. Such a monitoring and evaluation plan should include features that monitor program impacts on listed fish. This will require clear statements of measurable performance standards and performance indicators. It will also require statements of appropriate management responses when specific threshold levels of indicators are attained (or fail to be attained, depending upon the manner in which the indicator is stated).

We suggest that the following be included in assessing program performance.

1) Stray rates (% hatchery spawners present on spawning grounds with listed fish in specific subbasins): clear upper bounds that are in compliance with the Wild Salmonid Policy guidelines.
2) The proportion that the annual number of released hatchery juveniles bears to the estimated annual number of listed conspecific juveniles within the river basin or subbasin where the hatchery releases occur: a clear upper bound combined with a scaling of the absolute number of hatchery juveniles released to the estimated juvenile freshwater carrying capacity of the basin.
3) Hatchery smolt-to-adult survival rates, and wild smolt-to-adult survival rates. A lower limit to smolt-to-adult survival rates for hatchery fish should be established. Determination of an appropriate limit should include fitness considerations. Fitness considerations should include considerations of the long-term viability and productivity of the hatchery stock and considerations of the impacts on listed fish of interbreeding with hatchery strays at the upper acceptable level (specified under #1 above). A minimal, biologically acceptable lower limit on hatchery smolt-to-adult survival, however, cannot be purchased at the cost of significant size/condition differentials at the time of release between hatchery and listed juveniles. Limits (performance standards) need to be set on both the maximum size/condition differential between hatchery and listed juveniles and the minimum smolt-to-adult survival rate of hatchery juveniles. Both are required to assure that the program goal of minimizing adverse impacts on listed fish can be attained.

   In addition, a minimum wild smolt-to-adult survival rate should be established that would be sufficient to insure the recovery and long-term persistence of local in-basin populations. Estimation of this rate should take into account the modal value of age-specific female fecundity, the adult population age-structure and sex ratio, the expected range and distribution of variation in survival rates between egg deposition and adult return, and expected harvest impacts. While the role which hatchery releases may have in depressing wild smolt-to-adult rates may be unknown or controversial, it is certainly unexamined and un-monitored. Knowing whether and to what extent this may be occurring would appear to be essential to providing an acceptable evaluation of the performance of a hatchery

program. This cannot occur without establishing a performance standard for wild smolt-to-adult survival.

Section 1.16
The HGMP simply responds “None” to this important query. This is significantly inadequate.

One of the program goals is to conduct hatchery operations so as to minimize potential adverse impacts on listed fish. Significant thought should be given to ways in which facility operations might be altered or other program goals modified so as to achieve the goal of minimizing potential adverse impacts. These should be enumerated and discussed here together with a statement of reasons for not adopting such changes. At a minimum considerable detail should be provided to support a claim that current operations and goals are sufficiently protective of ESA concerns.

We suggest that the following be considered among the kinds of changes that would better satisfy the goal of minimizing potential adverse impacts on listed fish. 1) reducing the proposed number of juveniles released until stray rates within the basin are determined to be within the Wild Salmonid Policy and/or NMFS guidelines 2) changing rearing practices so as to produce juveniles that are similar in size and condition to wild conspecifics likely to be rearing in and migrating from the basin during the time of release; 3) within the limits of the facility, releasing juveniles over a more protracted period of time to more closely approximate the temporal distribution of wild juvenile migration, in order to avoid overwhelming wild juveniles with one large pulse of hatchery juveniles; 4) in combination with reducing or eliminating releases from the Voight facility into the Puyallup River Basin, release fingerling Chinook reared at Voight in other Puget Sound river basins lacking indigenous, listed Chinook populations.

NMFS’ Template clearly requires that such or similar alternatives be described and considered and “reasons why those actions are not being proposed” provided.

An obvious course of action in view of the nature of the program, the alleged and the largely unquantified benefits resulting from the program and the significant risks to listed chinook, is to reduce or eliminate the program altogether. It appears obvious that consideration of such an alternative in this section of the HGMP is mandatory.

Related to the alternatives of program reduction or elimination would be a consideration of how and whether habitat-management efforts could replace or augment hatchery production to meet some program goals at a lower level of biological risk. Efforts on the Skagit River provide an example for consideration. In 1980 and again in 1990, Seattle City Light (SCL) radically changed the operation of the Upper Skagit dams with increased commitments of flow to better accommodate salmon spawning and rearing. It is apparent there has been a shift of wild Skagit chinook production increasingly into that section upstream of Rockport.

Between 1974-1984 the percentage of the overall wild Skagit chinook population that spawned upstream of Rockport was 62%, between 1985-1993 it was 73%, and between 1094-2001 it was 78% (Connor and Pflug 2003). This sub-stock of chinook is the only one in the watershed that has remained in stable numbers in the period of spawning survey record between 1974-2001. For comparison, these same data indicate that the percentage of change in mean escapement between the 1974-1984 time period and the 1985-2001 time period was +3% for the Upper Skagit while it was -41% for the Lower Skagit and -52% for the Lower Sauk River, the major wild chinook spawning tributary to the Skagit. While the Upper Skagit wild chinook have remained stable, or increased slightly, the remaining basin has been in significant downward decline. From 1974-2001, the overall average wild Skagit chinook population escapement remained relatively stable: 1974-84 - 12,112; 1985-93 - 10,279; 1994-2001 - 11,526. Wild-chinook productivity for the population is being increasingly carried by the Upper Skagit.

Since 1980, SCL mitigation investments became increasingly focused on habitat acquisitions with related habitat protection, habitat restoration, or habitat re-creation projects (personal communication Dave Pflug 2000, 2001, 2002, per Bill McMillan, 2003). This contrasts with hydro electric dam mitigation for fish losses more commonly realized in the form of hatchery programs elsewhere. While Upper Skagit

wild chinook have remained stable, primarily from habitat investments as a priority over hatchery releases, the rest of the Skagit basin has remained in wild chinook decline at the same levels as other Puget Sound areas where habitat investments have most often been lower and hatchery domination commonly higher in those other river basins.

The Skagit system is the only place in the Puget Sound region where wild fish have a clear production advantage. Seiler et al. (2002a) show that the 12-year (1989-2000) annual production of wild fry and fingerlings averaged 2.8 million fish. This compares favorably with a relatively modest hatchery program planned for 672,000 fingerlings and 150,000 yearlings.

Evidence suggests that on the Skagit, where emphasis has been on moderation of hatchery chinook production, the result has been comparatively high wild fry and fingerling production. This credible alternative, with others, should be discussed and contrasted with the proposed alternative in this section, with a rationale for rejecting any. We do not believe that this HGMP can credibly qualify for take authorization without significant revision to this response.

Section 2.2.1
Pages 9-10 states that “migrating hatchery program smolts may compete with natural-origin and hatchery recovery program spring chinook fingerlings in the Puyallup River below the mouth of the White River and in the estuarine areas.” This appears to minimize the risk of competition given the large size of the hatchery fingerling program releases and the temporal and spatial overlap between listed and hatchery juveniles. It is highly likely that there will be competition. Moreover, NMFS requires that the potential level of take that may occur as a result of such competition be numerically estimated. The risk should also be discussed under section 1.16. A similar comment applies to section 2.2.3, page 12: “Migrating hatchery program smolts may compete with natural-origin fall chinook in the river below the hatchery release site and in the estuarine areas. This competition may result in some undetermined level of mortality in the natural-origin smolts.”

Section 2.2.3
While the response describes some hatchery activities that may lead to take, it generally fails to provide sufficient detail regarding risk potential and likely effects of the take. The projected annual take levels are inadequately characterized as “undetermined,” or dismissed as “unlikely” or “low/moderate” without adequate support provided for those assertions. The associated take table (Table 1) at the end of the HGMP lists Unintentional lethal take of egg-fry, juvenile/smolt, and adults as "unknown".

No attempt is made to estimate the level of this suspected take, yet this is what is explicitly requested by NMFS in the HGMP Template and in the HGMP Completion Guidelines dated January 5, 2000. Guideline G is especially relevant:

> Under the broad definition of ESA, "take", of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. When "take" of a listed species is expected in the hatchery operation, the ESA **requires** that a numerical estimate be quantified as best as possible. (emphasis added)

Merely listing "unknown" fails to qualify as providing a numerical estimate as best as possible.

Subsection 2.2.3 asks applicants to provide information regarding past and present levels of take, by type. The response to both queries is, once again, “unknown.” No attempt is made to provide “a range of potential take numbers to account for alternate or ‘worst case’ scenarios,” despite clear direction to do so in the HGMP Template.

Clearly, in the absence of case-specific data and adequate research there is considerable uncertainty to estimates of levels of take resulting from the factors enumerated under guideline G. However, this uncertainty neither excuses the HGMP from making a credible attempt to estimate take levels as

required by NMFS, nor does the presence of uncertainty itself render it impossible for credible estimates to be made.

In the context of the ESA it seems clear to Washington Trout that when faced with genuine uncertainty as to a potential harmful effect of a hatchery practice -- resulting either from lack of data and lack of past research, or from uncertainty regarding biological mechanisms involved in potentially harmful inter- and intra-specific interactions -- when estimating the potential level of the harmful impact, assumptions be employed that risk over-estimating the level of take, rather than risk under-estimating it! In other words, the estimation process ought to be more concerned with providing reasonably high power (low probability of making a Type II error) than with keeping the probability of making a Type I error low for a null hypothesis that hatchery releases cause no take. The HGMP is simply more concerned with wrongly estimating a level of take from predation by hatchery smolts than it is with failing to guard listed juvenile chinook against the credible risk of take from predation by hatchery smolts. As with most of the numerous factors responsible for the decline and listing of salmonid populations under the ESA, the listed resource is forced to bear the full burden of the uncertainty.

We also note that while the information and techniques available to undertake to provide estimates of levels of take may not reside within the staff at the hatchery facility or program level, WDFW does have staff knowledgeable and practiced in risk assessment. We believe that such staff must be more directly engaged in these aspects of completing HGMPs. The NMFS Science Center can likewise provide support for these types of assessments and analyses. We recommend that WDFW enlist the Science Center's assistance if necessary in making these critical assessments.

Subsection 2.2.3 asks the respondent to "[I]ndicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program." The response provided simply states, "Not applicable – no take levels are defined."

This is both unsatisfactory and disturbing. Critical to successfully pursuing the program goal of minimizing adverse impacts on listed fish is the existence of clear measurable quantitative impact-containment objectives (performance standards and indicators) and a monitoring program committed to collecting and analyzing the requisite data. An inevitable feature of a *bone fide* impact monitoring and evaluation program is a set of contingency plans for responding to the exceedence of threshold levels of impact.

We recommend that the Department develop quantifiable impact-containment objectives related to risk of take of listed juveniles by hatchery operations due to behavioral modification, competition, and predation, among other elements listed in Guideline G. In addition, we recommend that the Department assign a team consisting of individuals with experience in risk assessment and in wild stock research to work with individual hatchery managers in developing impact containment objectives, associated monitoring and research plans, and program responses to monitoring data that indicates that impact thresholds have been exceeded or are likely to be exceeded.

We believe any HGMP that presently lacks such a risk-based impact-containment program cannot credibly qualify for take authorization.

Section 3.1
This query is inappropriately left blank. The HGMP fails to address the relation of planned program releases to the co-managers' Future Brood Document, yet this appears to be the principal document governing production levels and coordination of production levels and releases between WDFW hatchery facilities and tribal facilities. The relationship between production levels proposed in the Future Brood Document and risk to ESA-listed salmonid species in Puget Sound should be addressed in this subsection. As previously noted, we believe that the magnitude of juvenile releases from each hatchery facility needs to be compared to local, within-basin, rearing capacity of listed juveniles as well as to the total number of hatchery juvenile releases planned for the whole of Puget Sound and Hood Canal.

It does not seem possible to adequately describe or characterize either the magnitude of a particular juvenile chinook program or its relationship to other management objectives without providing a sense of the scale of the proposed hatchery releases relative to the total planned production of hatchery juveniles in Puget Sound and Hood Canal and relative to the estimated numbers of listed juveniles within river basins and within the estuary and nearshore environments of Puget Sound and Hood Canal. This is a serious shortcoming of the HGMP in question.

Similarly, hatchery production level objectives contained in the Future Brood Document are directly related to both the harvest component and the hatchery component of the Co-Managers' Joint Resource Management Plan for Puget Sound Chinook (RMP), which are intended to obtain ESA 4(d) Take protection under Take Limit 6. The Voight fingerling HGMP is, in fact, essentially an attachment to the hatchery RMP. The relationship of proposed production levels and methods contained in this HGMP to these governing planning documents clearly requires to be discussed in this section of the HGMP.

WDFW's own Wild Salmonid Policy, adopted in 1997, provides clear performance standards and policy guidance for hatchery operations and practices throughout Washington State, including the whole of the Puget Sound chinook ESU. Since the listing of Puget Sound chinook in 1999, WDFW has repeatedly cited the WSP as a guiding document in its ESA-related recovery management. Yet no mention is made of the relationship or alignment of the hatchery program described in this HGMP with any particular performance standard or policy guidance in the WSP. Ample evidence suggests that current hatchery practices and operations, including practices and operations described in this and other HGMPs, are inconsistent with the WSP, as cited in Washington Trout's review of this and other HGMPs. The HGMP should describe the WSP standards and guidance, and discuss the relationship between this program and the WSP.

The Hatchery Scientific Review Group was mandated and funded by the US Congress to develop an independently reviewed scientific framework for evaluating and reforming hatchery practices in Washington, including the Puget Sound chinook ESU. The HSRG has issued two reports, detailing specific recommendations for changing hatchery operations throughout Puget Sound, and is nearing completion of a third report, detailing recommendations for Hood Canal. WDFW has worked closely with the HSRG and publicly declared support for the goals and specific recommendations of the HSRG. This section of the HGMP should discuss and describe the alignment of the HGMP to the HSRG recommendations.

Section 3.4
The response offers cursory descriptions of several current or proposed habitat protection and recovery strategies, but despite clear direction in the HGMP Template, it does not describe any major factors affecting natural production or any relationship or linkages between the program and assumptions regarding habitat conditions.

This subsection clearly is requesting an estimation of freshwater and estuary juvenile rearing capacity and current wild, listed, juvenile production. It is also asking for a description of major limiting factors to natural production and capacity as well as for local and regional efforts to redress limiting factors. In addition, it is requesting that an assessment of the efficacy of such efforts be made.

All of these are relevant to characterizing the scale of hatchery releases and to assessing the relationship of these releases to the recovery of the listed species. As we have repeatedly noted in these comments, the minimal starting point for such an assessment is an estimate of current juvenile production and capacity of the basin.

At least one objective of this subsection is to weigh the appropriateness of the hatchery program against the current and expected natural productivity of the affected watershed. How badly is this harvest augmentation program needed? Is the listed population capable of accommodating the biological risks imposed by the program? How long might it be necessary to tolerate those risks? Omitting this information from the HGMP leaves these and other important questions unanswered.

Section 5.7
Describe operational difficulties….Page 17, point #2: “Flood conditions in February 1996 caused … premature releases of an unknown number (>50K) of [coho] yearlings”. The risk of premature releases should be evaluated in terms of competition and predation ramifications. Facilities in flood prone areas may simply be too risky to continue operations

Section 10.11
Again, the boilerplate assertion is made that releasing fingerling smolts in May or June will “minimize the risk of residualization and impact upon natural fish.” No support is offered for the assertion, despite the fact that in SS 1.10 it is admitted that the outmigration timing of natural chinook juveniles is still “being determined.” No measures are described to “determine” emigration timing for wild chinook, to determine the risks from proposed releases to natural fish, to identify an acceptable level of impact on natural fish, or to monitor for those impacts, let alone avoid those risks or impacts. Clearly, further explication is required.

As noted earlier, NMFS guidance directs applicants to provide citation and documentation to support critical information provided in the HGMP. No report or other documentation is provided to support the assertion that releasing fingerlings smolts in May or June will “minimize the risk of residualization and impact upon natural fish” to below any acceptable level.

The response implies that releasing hatchery juveniles after the usual time of emigration of wild chinook smolts can effectively minimize potential adverse interactions. While the response ignores that wild emigration timing has not been determined, it also implies a gross over-simplification of the temporal distribution of the migration of wild listed juveniles from freshwater to saltwater habitats. Recent data on the timing of wild juvenile chinook outmigration in mid-Puget Sound rivers gathered by the Department's own Wild Salmon Production Evaluation Unit (WSPE) (Seiler et al. 2001(a), 2001(b), 2001(c), 2002, and 2003) provides substantial evidence that wild juvenile chinook downstream migration generally occurs over a protracted period of time ranging from February to July. The majority of this data is noteworthy in displaying no pronounced mode in the timing of wild chinook outmigration. Rather, outmigration appears to be more or less continuous with several small modes scattered from mid-March to mid-June. This makes it extremely unlikely that hatchery smolt releases can be scheduled to occur after wild emigration unless hatchery releases occur after late July.

The response fails to acknowledge current work that strongly suggests hatchery and wild juvenile chinook are commingling in near-shore habitats in Puget Sound for significant periods of time before migrating to the open ocean, any attempt at temporal segregation during emigration from upstream, freshwater habitats notwithstanding (see comments to section 1.8).

Section 11.1
The response in this subsection is restricted to asserting that production groups of released hatchery fish will bear one or more of several kinds of marks that will enable them to be identified in fisheries and on the spawning grounds.

At best this marking will create a *potentia*l for monitoring impacts of hatchery fish on wild fish, particularly in regards to straying onto the spawning grounds of natural origin fish. A monitoring and evaluation plan, however, should set impact-containment objectives for the measurement of which specific marks are relevant. Specific ranges or levels of impact of concern need to be explicitly stated (as quantitative performance standards), the means and manner by which such levels will be estimated identified using measurable quantities (performance indicators) and a range of management responses to various measured levels of each indicator identified. In brief, no monitoring plan has been identified and described, and no standards have been specified against which the results of monitoring could be *evaluated.*

Section 11.1.2
This response refers to the August 2002 *Joint RMP for Puget Sound Chinook Salmon Hatcheries*. This is the only reference to the RMP found by this review in the HGMP, even though Section 3 of the HGMP

Template specifically directs applicants to identify the relationship and alignment of the specific program to other ESU-wide management objectives or plans. The relationship and alignment of this hatchery program to the RMP needs to be described.

Section 11.2
The response simply asserts without any subsequent explanation that monitoring and evaluation "will be undertaken in a manner which does not result in an unauthorized take of listed chinook." This is grossly inadequate. It is, furthermore, a considerable exaggeration based upon the lack of substantive performance standards, indicators, and impact targets in the preceding sections of the HGMP. Of course, it is first necessary that a monitoring and evaluation plan be in place and be described in sufficient detail before one is in position to assert that the activities directly associated with monitoring activities themselves will not cause take. As previously noted, no monitoring and evaluation plan of sufficient detail for this purpose has been evidenced for this program by the HGMP.

It should also be noted that most of the responses in this section are repeated *verbatim* in more than several of the HGMPs currently under review. This leaves the distinct impression that this important section of the HGMP Template is inappropriately being filled out with boilerplate lifted from some master document, rather than with program-specific analyses.

Conclusion
The HGMP simply provides no reason to believe that unacceptable levels of take of listed species will not occur as a result of hatchery operations proposed and described therein. The HGMP quite simply commits to NO readily identifiable, measurable performance standards or indicators whatsoever. Nor does it identify alternative management actions that will or might be undertaken in light of the evaluation of the results of a clear quantitative monitoring program.

The intent of the HGMP Template and process would appear to be to evaluate several broad factors -- among which are: the justification for a particular hatchery program; the current state of the affected listed population; the potential for the program to take listed species, including a credible quantitative estimate of the level of the potential take, and the measures proposed by the program proponents to minimize that take (including a credible quantitative estimate of the expected extent of the resulting reduction in potential take and the ongoing monitoring and evaluation of those measures) -- and to weigh these factors against each other in order to determine if take authorization is warranted. In general, the responses provided to individual queries in the Template are cursory, lacking in sufficient detail, and often simply inappropriate.

The justification for the program is at best inadequately described. In Table 1, attached to the HGMP application, the level of unintentional take at all three life stages is listed as simply “unknown,” despite NMFS guidance requiring applicants to provide a “numerical estimate” of expected take levels. Measures to minimize take are either inadequately described or based on assertions left unsupported by any documentation. Likewise, the description of proposed methods for monitoring and evaluating those measures are unacceptably vague, at best.

Given these significant shortcomings, this review finds it nearly impossible to even evaluate the particulars of the proposed program. We find the application itself apparently inadequate to justify take authorization under the criteria enumerated in the 4d Rule. We are compelled to suggest that WDFW withdraw the application and redraft it, if it can provide the necessary information. If the necessary information is unavailable at this time, we suggest that WDFW reconsider the program, either discontinuing it or significantly scaling it back until it can provide pertinent information adequate to warrant take authorization.

Note:
Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

Soos Creek/Icy Creek Fall Chinook Yearling Program HGMP
Comments submitted by Washington Trout
August 1, 2003
Prepared by
Nick Gayeski; Ramon Vanden Brulle

Section 1.8
This program is an integrated harvest program whose purpose (goal) is augmentation.
The response to this section consists of the same five boilerplate points common to Puget Sound fingerling programs (with the term "Yearling" substituted for "Juvenile"), which as noted in our General Comments and elsewhere, fail to qualify as justifications for the program goal.

On its face, this response appears inappropriate, and would be better included in the response to SS 1.7. It describes two goals of the program, providing fish for harvest and minimizing "adverse genetic, demographic or ecological effects on listed fish", without providing justification for either. Why is it socially, economically, or biologically necessary, advisable, or even beneficial to provide fish for harvest using this program at this facility? Perhaps WDFW takes it for granted that providing fish for harvest is justification in itself, but NMFS should not have to when evaluating this program, nor, certainly, should the public.

There likely are several and varied justifications for providing fish for harvest. They should be listed and described in sufficient detail to be evaluated and weighed objectively against all direct and indirect take of listed species likely to occur as a result of the program.

Even taking for granted some general need for "fish for harvest" does not provide adequate justification for any particular program, including Icy Creek Yearling Chinook. Presumably, "fish for harvest" can be provided in any number of ways at any number of places. This response should describe why it is necessary to produce chinook fingerlings for harvest at Icy Creek under the specific protocols proposed – again, in order that such justification can be *weighed against* the risk of potential take that may occur, relative to other options, including discontinuing or scaling back the program.

Presumably, relative to take authorization, the standard of justification for an integrated harvest/augmentation program should be higher than for a recovery, preservation/conservation, or research program, or at least different. One should expect at best a very low level of biological "benefit" from a harvest/augmentation program. Therefore, a relatively high level of social and/or economic "benefit" should be described in detail in order to justify any biological risks of the program to listed Puget Sound chinook. The description should include information about the social or political obligation for the program, identify affected stakeholders, explain the program's success at providing the expected benefits, and/or supply numerical estimates of the economic activity that can be directly attributed to program activities.

WDFW appears to assume one or both of two things: that because the existing Program predates the listing of Puget Sound Chinook, the "benefit" of raising fish for harvest at this facility has already been established, and should not require detailed explication; or the assertion that the existing program will be run (or has been run) in order to "minimize adverse… effects on listed fish" is adequate to justify continuing the program. To be fair, guidance offered by NMFS in the HGMP template could be interpreted to imply as much. Nevertheless, Washington Trout considers both of these assumptions counterintuitive, and a misreading of both the spirit and the specific requirements of the 4d Rule and the HGMP template.

At any rate, the response for this subsection of the HGMP lacks detail sufficient to assure that the program will result in "adverse genetic, demographic or ecological effects on listed fish" being contained within quantifiable limits that can reasonably be considered to be "safe." The mere assertion that the Department's intention is to "provide fish for harvest while minimizing adverse… effects on listed fish" is insufficient.

The HGMP Template provides guidance that directs applicants to describe, "*how* the program will be operated to provide fish for harvest while minimizing adverse effects on listed fish." (Emphasis added.) The WDFW response merely asserts that it *will* operate the program thus (in language lifted nearly verbatim from the template). In order to meet the HGMP requirement to adequately describe how WDFW will accomplish these goals, quantitative standards that provide clear threshold levels of potential adverse impact to be avoided need to be stated, and then clearly linked to quantitative monitoring variables.

The response includes several distinct points describing aspects of program operations that are intended to reduce potential adverse impacts of the release of hatchery fingerlings on listed chinook. However, we believe that these points fail to include or refer to appropriate measurable quantitative standards and/or rely on dubious or unjustified assumptions about the sources of adverse impact and how they may best be minimized. Further, the fact that these points are repeated virtually *verbatim* and without adequate case-specific qualifying information in nearly every HGMP suggests that they are a boilerplate substitute for thoughtful analysis.

In the context of the ESA it is insufficient merely to assert that program operations will endeavor to minimize adverse impacts to listed species. It is necessary to quantify the level of take likely to result from these operations; that is, it is necessary to quantify the amount of take that is expected to result when program operations are configured so as to produce a "minimal" level of impact. NMFS in its January 5, 2002 guidance document titled *Hatchery and Genetic Management Plan Template: Purpose, Applications, and Instructions,* clearly directs HGMP applicants to supply a "numerical estimate" of expected take from hatchery operations "as best as possible" (paragraph G).

Point #1 of the HGMP repeats the boilerplate assertion that "[j]uvenile chinook will be released after the usual wild chinook emigration time to minimize potential adverse interactions." This fails to address several relevant issues in sufficient detail. It ignores the issue of relative size between released hatchery smolts and wild conspecifics. Both competition and predation are dependent upon the relative sizes of the individuals involved and hatchery smolts are generally released at sizes significantly larger than wild juvenile conspecifics of the same age.

Both competitive ability and predation potential need to be explicitly considered in order to evaluate the extent to which the time of release and the duration of migration to saltwater of released hatchery fish may negatively impact wild listed juveniles. This requires, at a minimum, that the relative sizes of released hatchery smolts and wild listed juveniles be specified and then evaluated with respect to potential levels of competition and predation. Moreover, it is important to specify the expected *distribution* of sizes of released hatchery smolts and of wild listed juveniles that may be affected by the released smolts and to specify the absolute numbers of hatchery releases relative to both the expected numbers of rearing and migrating listed juveniles and the capacity of the river basin for rearing listed juveniles.

It is inadequate to assume that there is a single size (i.e., the mean size) of hatchery smolts at the time of release and that there is a single (mean) size of wild listed juveniles during the time of emigration of hatchery smolts. The respective distributions of sizes is needed in order to properly estimate the likelihood of competitive displacement and/or predation by hatchery smolts on wild listed juveniles during the period of freshwater emigration of released hatchery smolts.

The response implies a gross over-simplification of the temporal distribution of the migration of wild listed juveniles from freshwater to saltwater habitats. Recent data on the timing of wild juvenile chinook outmigration in mid-Puget Sound rivers gathered by the Department's own Wild Salmon Production Evaluation Unit (WSPE) (Seiler et al. 2001(a), 2001(b), 2001(c), 2002, and 2003) provides substantial evidence that wild juvenile chinook downstream migration generally occurs over a protracted period of time ranging from February to July. The majority of this data is noteworthy in displaying no pronounced mode in the timing of wild chinook outmigration. Rather, outmigration appears to be more or less continuous with several small modes scattered from mid-March to mid-June. This makes it extremely

unlikely that hatchery smolt releases can be scheduled to occur “after the usual wild chinook emigration time" unless hatchery releases occur after late July.

The response fails to acknowledge current work that strongly suggests hatchery and wild juvenile chinook are commingling in near-shore habitats in Puget Sound for significant periods of time before migrating to the open ocean, any attempt at temporal segregation during emigration from upstream, freshwater habitats notwithstanding. Early data from beach-seine and surface-trawl sampling in Skagit Bay in 2002 demonstrate that hatchery-marked and unmarked chinook juveniles of various age and size classes are present together in significant ratios throughout the spring, summer, and fall, in several types of estuarine and near shore habitats. Sampled hatchery-marked juveniles are mixed with unmarked juveniles in mean percentages ranging from 10% to nearly 60% from May through November (personal comm., Casey Rice, NMFS; 2003). Both hatchery-marked and unmarked fish-presence is consistent throughout these periods, but attempts to identify exact ratios of hatchery to wild juveniles are confounded by the fact that some hatchery juveniles released outside but nearby the study area are not visibly marked, and may be entering the study area during certain sampling periods, creating a possibility of undercounting hatchery juveniles during sampling. During the periods that hatchery and wild juveniles are present together in these near shore environments, the hatchery juveniles may enjoy several competitive advantages over their wild counterparts, including most significantly size, which may contribute to create a significant risk of adverse interactions and impacts to listed chinook, including competition, displacement, and predation. WDFW is aware of these preliminary findings and should understand their implications. These data should warrant some discussion and analysis in this context, insofar as WDFW is asserting that it can successfully minimize adverse impacts to listed Puget Sound chinook by effectively segregating wild and hatchery juveniles during freshwater out-migration and rearing life stages.

The response fails to describe *how* WDFW has determined that the assertions contained in each of these points is true or likely to be true, or describe to what extent they are true. How does releasing juveniles as smolts minimize emigration time? How effectively does it achieve this objective? How effectively has WDFW’s acclimation practices minimized straying? How will the practices proposed differ from past practices, if at all? The assumptions underlying the answers to these and other pertinent questions may be well known to WDFW, NMFS, and even some members of the interested public, but that cannot excuse their omission from a document intended for public review and analysis under the ESA.

Guidance from NMFS on completing the HGMP Template directs applicants to “cite relevant reports… or other analysis (sic) or plans that provide pertinent background information to facilitate evaluation of the HGMP,” and to “provide additional support of critical information” submitted in the HGMPs. The justification for the program would appear to be critical information, yet WDFW provides no citations or documentation to support the assertions made in the response.

No justification is, therefore, provided in this section as required by NMFS. What is required is a detailed *justification* phrased in terms of a motivation of potential benefits ensuing from the program, with alleged benefits subsequently weighed against a credible quantitative estimate of the risks to listed species. Such a proper risk-benefit analysis should then be accompanied (in sections 1.9 and 1.10) by the specification of biologically relevant quantitative performance standards and indicators that are then connected to a comprehensive monitoring and evaluation plan specifying how program activities will be altered in an appropriately timely manner when the monitoring data indicates that impact-containment thresholds have been exceeded.

Since this is an Isolated Harvest program that is based upon the creation of an artificial chinook life history that has never existed naturally in Puget Sound and Hood Canal, one would also expect that the non-biological benefits of such a program would have to be considerable in order to outweigh the palpable risks posed by this posed by the program to listed chinook in the Snohomish Basin and Puget Sound estuary and nearshore environments. Unfortunately this is not the case. No attempt is made to provide a credible justification of this program in terms of socio-economic benefits that have been carefully weighed against biological risks to listed chinook.

In sum, it appears that the combined responses to SS 1.7 and SS 1.8 constitute no more than an *inadequate* response to SS 1.7. As a result SS 1.8 is essentially left *unanswered.* As noted above, without an adequately described *justification* for the program, there is virtually no way for federal regulators or the public to evaluate or weigh the potential risks of the program against any supposed benefits, regardless of the scope or probability of those risks. This shortcoming alone would appear to render this HGMP application inadequate for federal approval.

Section 1.10
On page 3 (section 1.8 #2) it is erroneously stated that "[y]earling chinook will be released after the usual time of emigration to saltwater …" The Table accompanying section 1.10 (page 5) , states the time of release of yearling smolts as April. As discussed in our comments on the Wallace fingerling program, this release will occur when wild juvenile chinook are both rearing and migrating in the Green River Basin from the mouth of Icy Creek downstream. There will be significant spatial and temporal overlap between the two creating significant opportunity for both competitive displacement and behavioral modification of listed juveniles and predation. NMFS requires that a numerical estimate of the resulting take be estimated. The HGMP fails to provide this, stating (section 2.2.3, page 10) only that juvenile releases "may cause an unknown level of competition and predation risk to listed fish."

Section 1.11.2
The HGMP complies by listing in the table the total number of fingerlings to be released annually. While this complies with the letter of the HGMP template, it fails to provide either NMFS or the public with enough information to properly judge the scale of the hatchery releases and their potential direct and cumulative impact on listed fish in the river basin in which the releases occur and in the associated estuary and Puget Sound nearshore environments. Some sense of the scale of hatchery releases relative to the number of wild listed juveniles likely to be present in these environments during and shortly after the time of hatchery releases is required in order to adequately judge the size of the program and assess the potential contribution of the releases from specific programs and facilities to the cumulative impact of hatchery releases on listed fish.

We therefore recommend that in addition to listing hatchery facility releases an estimate also be made of the total numbers (by species) of wild salmonid juveniles (listed and unlisted) that are expected to be rearing in and migrating out of the river basin in which the releases are planned to occur. We further recommend that the HGMP list estimates of the numbers of hatchery juveniles of each species of salmon that are expected to be migrating through and rearing in the nearshore of Puget Sound or Hood Canal between the mouth of the river on which the hatchery in question is located (or in which the hatchery releases occur) and the entrances to Hood Canal and Puget Sound and that these numbers be compared to estimates of cumulative numbers (by species) of wild juveniles. Only this kind of comparative data in addition to the numbers of juveniles proposed to be released by the facility for which the HGMP is written can provide NMFS and the public with the appropriate sense of the expected size of the program.

Section 1.12
The response does not supply program goals for the parameters reported, despite clear guidance from the HGMP Template. Little information is offered at the level of detail queried. The response lists an average adult return from brood years 1987 to 1993 (excluding 1991) of 3080, but this is not broken down any further with regard to specific regions and fisheries, nor is it translated into any economic benefit.

Yearling chinook programs raise chinook to unnaturally large sizes (160 to 200 mm fork length, depending on condition factor) within one year. Such large individuals are readily capable of preying upon the largest wild juvenile chinook fingerlings present in Puget Sound and Hood Canal rivers and estuaries between the beginning of April and the end of June. This risk requires to be quantitatively estimated. In addition, these large hatchery chinook smolts can be expected to survive at significantly higher rates than hatchery fingerling smolts, rendering their numeric impact on wild chinook juveniles equivalent to anywhere from two to ten times that of the same number of hatchery fingerlings. The 300,000 yearling proposed to be released from the Soos Creek/Icy creek facility will be equivalent to

600,000 to more than one million fingerlings. Nowhere in the HGMP are these differential impacts on listed juveniles taken into account.

We believe that more is required in addressing this subsection of the HGMP than has been provided, including a description of a monitoring and evaluation plan that has been (or will be) employed in measuring program performance. Such a monitoring and evaluation plan should include features that monitor program impacts on listed fish. This will require clear statements of measurable performance standards and performance indicators. It will also require statements of appropriate management responses when specific threshold levels of indicators are attained (or fail to be attained, depending upon the manner in which the indicator is stated).

We suggest that the following be included in assessing program performance.

4) Stray rates (% hatchery spawners present on spawning grounds with listed fish in specific subbasins): clear upper bounds that are in compliance with the Wild Salmonid Policy guidelines.
5) The proportion that the annual number of released hatchery juveniles bears to the estimated annual number of listed conspecific juveniles within the river basin or subbasin where the hatchery releases occur: a clear upper bound combined with a scaling of the absolute number of hatchery juveniles released to the estimated juvenile freshwater carrying capacity of the basin.
6) Hatchery smolt-to-adult survival rates, and wild smolt-to-adult survival rates. A lower limit to smolt-to-adult survival rates for hatchery fish should be established. Determination of an appropriate limit should include fitness considerations. Fitness considerations should include considerations of the long-term viability and productivity of the hatchery stock and considerations of the impacts on listed fish of interbreeding with hatchery strays at the upper acceptable level (specified under #1 above). A minimal, biologically acceptable lower limit on hatchery smolt-to-adult survival, however, cannot be purchased at the cost of significant size/condition differentials at the time of release between hatchery and listed juveniles. Limits (performance standards) need to be set on both the maximum size/condition differential between hatchery and listed juveniles and the minimum smolt-to-adult survival rate of hatchery juveniles. Both are required to assure that the program goal of minimizing adverse impacts on listed fish can be attained.

   In addition, a minimum wild smolt-to-adult survival rate should be established that would be sufficient to insure the recovery and long-term persistence of local in-basin populations. Estimation of this rate should take into account the modal value of age-specific female fecundity, the adult population age-structure and sex ratio, the expected range and distribution of variation in survival rates between egg deposition and adult return, and expected harvest impacts. While the role which hatchery releases may have in depressing wild smolt-to-adult rates may be unknown or controversial, it is certainly unexamined and un-monitored. Knowing whether and to what extent this may be occurring would appear to be essential to providing an acceptable evaluation of the performance of a hatchery program. This cannot occur without establishing a performance standard for wild smolt-to-adult survival.

Section 1.16
The response lists a consideration of imprinting “yearlings for several months at Soos Creek to reduce straying into the Green river natural population.” The extent or status of this “consideration” requires to be explained. This response at least implies an awareness of and some concern over the significant levels of straying of returning adults from the yearling program to natural spawning areas of the Green River Mainstem and Newaukum Creek, into which no hatchery chinook are planted.

However The proposed “considered” strategy should be contrasted with other strategies, including program reduction/elimination. One of the program goals is to conduct hatchery operations so as to minimize potential adverse impacts on listed fish. Significant thought should be given to ways in which facility operations might be altered or other program goals modified so as to achieve the goal of

minimizing potential adverse impacts. These should be enumerated and discussed here together with a statement of reasons for not adopting such changes. At a minimum considerable detail should be provided to support a claim that current operations and goals are sufficiently protective of ESA concerns.

Several credible alternatives could better satisfy the goal of minimizing potential adverse impacts on listed fish, including: 1) reducing the proposed number of juveniles released until stray rates within the basin are determined to be within the Wild Salmonid Policy and/or NMFS guidelines; 2) changing rearing practices so as to produce juveniles that are similar in size and condition to wild conspecifics likely to be rearing in and migrating from the basin during the time of release; 3) within the limits of the facility, releasing juveniles over a more protracted period of time to more closely approximate the temporal distribution of wild juvenile migration, in order to avoid overwhelming wild juveniles with one large pulse of hatchery juveniles; 4) in combination with reducing or eliminating releases, release yearling Chinook reared at Icy Creek in other Puget Sound river basins lacking indigenous, listed Chinook populations.

An obvious course of action in view of the nature of the program, the alleged and the largely unquantified benefits resulting from the program and the significant risks to listed chinook, is to reduce or eliminate the program altogether. It appears obvious that consideration of such an alternative in this section of the HGMP is mandatory.

Related to the alternatives of program reduction or elimination would be a consideration of how and whether habitat-management efforts could replace or augment hatchery production to meet some program goals at a lower level of biological risk. Efforts on the Skagit River provide an example for consideration. In 1980 and again in 1990, Seattle City Light (SCL) radically changed the operation of the Upper Skagit dams with increased commitments of flow to better accommodate salmon spawning and rearing. It is apparent there has been a shift of wild Skagit chinook production increasingly into that section upstream of Rockport.

Between 1974-1984 the percentage of the overall wild Skagit chinook population that spawned upstream of Rockport was 62%, between 1985-1993 it was 73%, and between 1094-2001 it was 78% (Connor and Pflug 2003). This sub-stock of chinook is the only one in the watershed that has remained in stable numbers in the period of spawning survey record between 1974-2001. For comparison, these same data indicate that the percentage of change in mean escapement between the 1974-1984 time period and the 1985-2001 time period was +3% for the Upper Skagit while it was -41% for the Lower Skagit and -52% for the Lower Sauk River, the major wild chinook spawning tributary to the Skagit. While the Upper Skagit wild chinook have remained stable, or increased slightly, the remaining basin has been in significant downward decline. From 1974-2001, the overall average wild Skagit chinook population escapement remained relatively stable: 1974-84 - 12,112; 1985-93 - 10,279; 1994-2001 - 11,526. Wild-chinook productivity for the population is being increasingly carried by the Upper Skagit.

Since 1980, SCL mitigation investments became increasingly focused on habitat acquisitions with related habitat protection, habitat restoration, or habitat re-creation projects (personal communication Dave Pflug 2000, 2001, 2002, per Bill McMillan, 2003). This contrasts with hydro electric dam mitigation for fish losses more commonly realized in the form of hatchery programs elsewhere. While Upper Skagit wild chinook have remained stable, primarily from habitat investments as a priority over hatchery releases, the rest of the Skagit basin has remained in wild chinook decline at the same levels as other Puget Sound areas where habitat investments have most often been lower and hatchery domination commonly higher in those other river basins.

The Skagit system is the only place in the Puget Sound region where wild fish have a clear production advantage. Seiler et al. (2002a) show that the 12-year (1989-2000) annual production of wild fry and fingerlings averaged 2.8 million fish. This compares favorably with a relatively modest hatchery program planned for 672,000 fingerlings and 150,000 yearlings.

Evidence suggests that on the Skagit, where emphasis has been on moderation of hatchery chinook production, the result has been comparatively high wild fry and fingerling production. This credible alternative, with others, should be discussed and contrasted with the proposed alternative in this section,

with a rationale for rejecting any. We do not believe that this HGMP can credibly qualify for take authorization without significant revision to this response.

Section 2.2.3
While the response describes some hatchery activities that may lead to take, it generally fails to provide sufficient detail regarding risk potential and likely effects of the take. The take levels are inadequately characterized as "unknown," or dismissed as "very low" or "low" without adequate support provided for those assertions.

No attempt is made to estimate the level of suspected take, yet this is what is explicitly requested by NMFS in the HGMP Template and in the HGMP Completion Guidelines dated January 5, 2000. Guideline G is especially relevant:

> Under the broad definition of ESA, "take", of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. When "take" of a listed species is expected in the hatchery operation, the ESA **requires** that a numerical estimate be quantified as best as possible. (emphasis added)

Subsection 2.2.3 asks applicants to provide information regarding past and present levels of take, by type. To it's credit, the response offers an actual numerical take-estimate, whereas many if not most other HGMPs simply respond, "unknown." However the numerical estimate is not broken down by type, or otherwise adequately explained. The adult take appears to be an estimate of direct take from brood-stock collection activities. The juvenile take estimate is not explicated. There is no discussion or attempt to estimate the level of indirect take resulting from the type of activities described above, despite the clear and acknowledged risks involved. No attempt is made to provide "a range of potential take numbers to account for alternate or 'worst case' scenarios," despite clear direction to do so in the HGMP Template.

Clearly, in the absence of case-specific data and adequate research there is considerable uncertainty to estimates of levels of take resulting from the factors enumerated under guideline G. However, this uncertainty neither excuses the HGMP from making a credible attempt to estimate take levels as required by NMFS, nor does the presence of uncertainty itself render it impossible for credible estimates to be made.

In the context of the ESA it seems clear to Washington Trout that when faced with genuine uncertainty as to a potential harmful effect of a hatchery practice -- resulting either from lack of data and lack of past research, or from uncertainty regarding biological mechanisms involved in potentially harmful inter- and intra-specific interactions -- when estimating the potential level of the harmful impact, assumptions be employed that risk over-estimating the level of take, rather than risk under-estimating it! In other words, the estimation process ought to be more concerned with providing reasonably high power (low probability of making a Type II error) than with keeping the probability of making a Type I error low for a null hypothesis that hatchery releases cause no take. The HGMP is simply more concerned with wrongly estimating a level of take from predation by hatchery smolts than it is with failing to guard listed juvenile chinook against the credible risk of take from predation by hatchery smolts. As with most of the numerous factors responsible for the decline and listing of salmonid populations under the ESA, the listed resource is forced to bear the full burden of the uncertainty.

We also note that while the information and techniques available to undertake to provide estimates of levels of take may not reside within the staff at the hatchery facility or program level, WDFW does have staff knowledgeable and practiced in risk assessment. We believe that such staff must be more directly engaged in these aspects of completing HGMPs. The NMFS Science Center can likewise provide support for these types of assessments and analyses. We recommend that WDFW enlist the Science Center's assistance if necessary in making these critical assessments.

Subsection 2.2.3 asks the respondent to "[I]ndicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program." The response provides a vague pledge to consult NMFS “take levels” are exceeded.

This is both unsatisfactory and disturbing. A promise to consult is not a specific contingency plan, and the “take level” is not identified. Is it the current level of take, estimated in Table 1.? It should be explained how those levels were determined to be appropriate thresholds.

Critical to successfully pursuing the program goal of minimizing adverse impacts on listed fish is the existence of clear measurable quantitative impact-containment objectives (performance standards and indicators) and a monitoring program committed to collecting and analyzing the requisite data. An inevitable feature of a *bone fide* impact monitoring and evaluation program is a set of contingency plans for responding to the exceedence of threshold levels of impact.

We recommend that the Department develop quantifiable impact-containment objectives related to risk of take of listed juveniles by hatchery operations due to behavioral modification, competition, and predation, among other elements listed in Guideline G. In addition, we recommend that the Department assign a team consisting of individuals with experience in risk assessment and in wild stock research to work with individual hatchery managers in developing impact containment objectives, associated monitoring and research plans, and program responses to monitoring data that indicates that impact thresholds have been exceeded or are likely to be exceeded.

We believe that it is not possible to approve any HGMP that presently lacks such a risk-based impact-containment program.

Section 3.1
The HGMP fails to address the relation of planned program releases to the co-managers’ Future Brood Document, yet this appears to be the principal document governing production levels and coordination of production levels and releases between WDFW hatchery facilities and tribal facilities. The relationship between production levels proposed in the Future Brood Document and risk to ESA-listed salmonid species in Puget Sound should be addressed in this subsection. As previously noted, we believe that the magnitude of juvenile releases from each hatchery facility needs to be compared to local, within-basin, rearing capacity of listed juveniles as well as to the total number of hatchery juvenile releases planned for the whole of Puget Sound and Hood Canal.

It does not seem possible to adequately describe or characterize either the magnitude of a particular chinook program or its relationship to other management objectives without providing a sense of the scale of the proposed hatchery releases relative to the total planned production of hatchery juveniles in Puget Sound and Hood Canal and relative to the estimated numbers of listed juveniles within river basins and within the estuary and nearshore environments of Puget Sound and Hood Canal. This is a serious shortcoming of the HGMP in question.

Similarly, hatchery production level objectives contained in the Future Brood Document are directly related to both the harvest component and the hatchery component of the Co-Managers’ Joint Resource Management Plan for Puget Sound Chinook (RMP), which are intended to obtain ESA 4(d) Take protection under Take Limit 6. The Voight fingerling HGMP is, in fact, essentially an attachment to the hatchery RMP. The relationship of proposed production levels and methods contained in this HGMP to these governing planning documents clearly requires to be discussed in this section of the HGMP.

WDFW’s own Wild Salmonid Policy, adopted in 1997, provides clear performance standards and policy guidance for hatchery operations and practices throughout Washington State, including the whole of the Puget Sound chinook ESU. Since the listing of Puget Sound chinook in 1999, WDFW has repeatedly cited the WSP as a guiding document in its ESA-related recovery management. Yet no mention is made of the relationship or alignment of the hatchery program described in this HGMP with any particular performance standard or policy guidance in the WSP. Ample evidence suggests that current hatchery

practices and operations, including practices and operations described in this and other HGMPs, are inconsistent with the WSP, as cited in Washington Trout's review of this and other HGMPs. The HGMP should describe the WSP standards and guidance, and discuss the relationship between this program and the WSP.

The Hatchery Scientific Review Group was mandated and funded by the US Congress to develop an independently reviewed scientific framework for evaluating and reforming hatchery practices in Washington, including the Puget Sound chinook ESU. The HSRG has issued two reports, detailing specific recommendations for changing hatchery operations throughout Puget Sound, and is nearing completion of a third report, detailing recommendations for Hood Canal. WDFW has worked closely with the HSRG and publicly declared support for the goals and specific recommendations of the HSRG. This section of the HGMP should discuss and describe the alignment of the HGMP to the HSRG recommendations.

Section 3.3.1
The HGMP simply asserts that program fish contribute to "North American fisheries … 88% are caught in Washington waters" (page 11). These figures are not translated into economic terms. Hence no possible socio-economic benefit is described and evaluated that could possibly be weighed in the balance against the considerable risks the program poses to listed fish. This appears to us to be a fatal inadequacy of the HGMP. We fail to conceive how NMFS can approve this or any similar HGMP in the absence of any credible attempt to quantify the alleged harvest benefits against which the several significant risks to listed chinook must be weighed if the endeavor to provide these benefits is to be *justified*!

Section 3.4
The response offers the terse admission that the program has no relation to any current or proposed habitat protection and recovery strategies, but despite clear direction in the HGMP Template, it does not describe any major factors affecting natural production or any relationship or linkages between the program and assumptions regarding habitat conditions.

This subsection clearly is requesting an estimation of freshwater and estuary juvenile rearing capacity and current wild, listed, juvenile production. It is also asking for a description of major limiting factors to natural production and capacity as well as for local and regional efforts to redress limiting factors. In addition, it is requesting that an assessment of the efficacy of such efforts be made.

All of these are relevant to characterizing the scale of hatchery releases and to assessing the relationship of these releases to the recovery of the listed species. As we have repeatedly noted in these comments, the minimal starting point for such an assessment is an estimate of current juvenile production and capacity of the basin.

At least one objective of this subsection is to weigh the appropriateness of the hatchery program against the current and expected natural productivity of the affected watershed. How badly is this harvest augmentation program needed? Is the listed population capable of accommodating the biological risks imposed by the program? How long might it be necessary to tolerate those risks? Omitting this information from the HGMP leaves these and other important questions unanswered.

Section 3.5.
The HGMP states that "Icy Creek yearling chinook prey to an unknown extent on listed fish (Risk Assessment, WDFW, 2000). Competition, according to the risk assessment, with listed fish is high." Despite this, as noted previously, no quantitative estimate of the take resulting from such risk is provided. No details of the WDFW Risk Assessment are reported, nor is the document attached as an Appendix.

Section 10.11
The boilerplate assertion is made that releasing yearling smolts in April will "minimize the risk of residualization and impact upon natural fish." No support is offered for the assertion. No measures are

described to determine the risks from proposed releases to natural fish, to identify an acceptable level of impact on natural fish, or to monitor for those impacts, let alone avoid those risks or impacts. As noted above, the risks of competition and predation from yearling releases are considerable, with credible indications that the assumptions underlying the proposed strategy are flawed, and that the proposed release strategy may be inadequate to minimize these adverse ecological effects. There is no discussion of measures designed to minimize adverse genetic impacts. Clearly, further explication is required.

As noted earlier, NMFS guidance directs applicants to provide citation and documentation to support critical information provided in the HGMP. No report or other documentation is provided to support the assertion that releasing fingerlings smolts in May or June will "minimize the risk of residualization and impact upon natural fish" to below any acceptable level.

The response implies that releasing hatchery juveniles after the usual time of emigration of wild chinook smolts can effectively minimize potential adverse interactions. As noted in our comments to Section 1.8, this assertion implies a gross over-simplification of the temporal distribution of the migration of wild listed juveniles from freshwater to saltwater habitats, and
fails to acknowledge current work that strongly suggests hatchery and wild juvenile chinook are commingling in near-shore habitats in Puget Sound for significant periods of time before migrating to the open ocean, any attempt at temporal segregation during emigration from upstream, freshwater habitats notwithstanding.

Section 11.1
The response in this subsection is restricted to asserting that production groups of released hatchery fish will bear one or more of several kinds of marks that will enable them to be identified in fisheries and on the spawning grounds.

At best this marking will create a *potentia*l for monitoring impacts of hatchery fish on wild fish, particularly in regards to straying onto the spawning grounds of natural origin fish. A monitoring and evaluation plan, however, should set impact-containment objectives for the measurement of which specific marks are relevant. Specific ranges or levels of impact of concern need to be explicitly stated (as quantitative performance standards), the means and manner by which such levels will be estimated identified using measurable quantities (performance indicators) and a range of management responses to various measured levels of each indicator identified. In brief, no monitoring plan has been identified and described, and no standards have been specified against which the results of monitoring could be *evaluated.*

Section 11.1.2
This response refers to the August 2002 *Joint RMP for Puget Sound Chinook Salmon Hatcheries*. This is the only reference to the RMP found by this review in the HGMP, even though Section 3 of the HGMP Template specifically directs applicants to identify the relationship and alignment of the specific program to other ESU-wide management objectives or plans. The relationship and alignment of this hatchery program to the RMP needs to be described.

Section 11.2
The response simply asserts without any subsequent explanation that monitoring and evaluation "will be undertaken in a manner which does not result in an unauthorized take of listed chinook." This is grossly inadequate. It is, furthermore, a considerable exaggeration based upon the lack of substantive performance standards, indicators, and impact targets in the preceding sections of the HGMP. Of course, it is first necessary that a monitoring and evaluation plan be in place and be described in sufficient detail before one is in position to assert that the activities directly associated with monitoring activities themselves will not cause take. As previously noted, no monitoring and evaluation of sufficient detail for this purpose has been evidenced for this program by the HGMP.

It should also be noted that most of the responses in this section are repeated *verbatim* in more than several of the HGMPs currently under review. This leaves the distinct impression that this important section of the HGMP Template is inappropriately being filled out with boilerplate lifted from some master document, rather than with program-specific analyses.

Conclusion
The HGMP simply provides no reason to believe that unacceptable levels of take of listed species will not occur as a result of hatchery operations proposed and described herein. The HGMP quite simply commits to NO readily identifiable, measurable performance standards or indicators whatsoever. Nor does it identify alternative management actions that will or might be undertaken in light of the evaluation of the results of a clear quantitative monitoring program.

The intent of the HGMP Template and process would appear to be to evaluate several broad factors -- among which are: the justification for a particular hatchery program; the current state of the affected listed population; the potential for the program to take listed species, including a credible quantitative estimate of the level of the potential take, and the measures proposed by the program proponents to minimize that take (including a credible quantitative estimate of the expected extent of the resulting reduction in potential take and the ongoing monitoring and evaluation of those measures) -- and to weigh these factors against each other in order to determine if take authorization is warranted. In general, the responses provided to individual queries in the Template are cursory, lacking in sufficient detail, and often simply inappropriate.

The justification for the program is at best inadequately described. Despite NMFS guidance requiring applicants to provide a “numerical estimate” of expected take levels, those levels and measures to minimize them are either inadequately described or based on assertions left unsupported by any documentation. Likewise, the description of proposed methods for monitoring and evaluating those measures are unacceptably vague, at best.

Given these significant shortcomings, this review finds it nearly impossible to even evaluate the particulars of the proposed program. We find the application itself apparently inadequate to justify take authorization under the criteria enumerated in the 4d Rule. We are compelled to suggest that WDFW withdraw the application and redraft it, if it can provide the necessary information. If the necessary information is unavailable at this time, we suggest that WDFW reconsider the program, either discontinuing it or significantly scaling it back until it can provide pertinent information adequate to warrant take authorization.

Note:
Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

Soos Creek Fall Fingerling Chinook Program HGMP
Comments submitted by Washington Trout
August 1, 2003
Prepared by Nick Gayeski

Section 1.8
The HGMP repeats the boilerplate assertion that "[j]uvenile chinook will be released after the usual wild chinook emigration time to minimize potential adverse interactions." This statement is simply incorrect. Seiler et al. (2002b) found that there was a bi-modal emigration of wild chinook from the Green River. An early fry component migrated between February and early April. This was followed by a fingerling component that migrated from May through June. The planned release date of hatchery fingerlings is May. In addition, section 2.2.1 of the HGMP (page 8) states that "[a]rrival of both hatchery and naturally-produced smolts in the estuary peaks in May, and *after a few weeks*, most begin moving to nearshore feeding grounds in Puget Sound and the Pacific Ocean" (our emphasis).

Moreover, this boilerplate assertion is contradicted in the Table of Performance Standards and Indicators on pages 3 – 6 which lists May as the outmigration timing of both listed and hatchery fish. This is (inappropriately, as we have noted in our general comments and our detailed comments on the Wallace Fingerling Program) listed as a "performance indicator" associated with the "performance standard" "Minimize interactions with listed fish through proper rearing and release strategies". It is less than perfectly clear how this alleged direct overlap in outmigration timing of listed and hatchery juveniles is reflective of a proper release strategy designed to minimize interactions with listed fish.

On the contrary, this inconsistency regarding the relationship of fundamental hatchery practices to harmful impacts on listed juveniles creates a troublesome suggestion that WDFW may not have placed a high enough priority on critically thinking about whether or how to subordinate hatchery programs and practices to avoid levels of take of listed Chinook that may be jeopardizing their recovery.

Section 1.16
Despite the considerable likelihood of harmful impacts of the hatchery program on listed chinook there is No Response provided for this section.

It is appears clear from information already discussed and from that presented in section 2.2.2 of this HGMP regarding stray rates that the percentage of hatchery fish in natural spawning escapements will be far above the quantitative limitation expressed in the Wild Salmonid Policy (For a high level of similarity of hatchery fish, the maximum percent of the wild spawning population that is of hatchery origin should be 5 to 10%). A logical alternative action would be a major reduction in size of the program. This should be clearly and adequately discussed, and reasons for not proposing such alternative action provided – as required by NMFS in the HGMP Template

Section 3.5
"Soos Creek fingerling chinook have a low probability of preying on/competing with listed fish (Risk Assessment, WDFW, 2000)".

In view of the data provided and discussed this is counter-intuitive. Risk of competition in Soos Creek, rearing areas in the Green river/Duwamish downstream of Soos Creek, and in the estuary would appear to be appreciable. In any event no details from the Risk Assessment are provided, nor is the Risk Assessment document cited in the references nor provided as an attachment for review.

Section 5.7
On page 13, point #2 states that "[f]lood risk limits the use of eight, low lying, standard rearing ponds as the flood waters often inundate them and allow the premature releases of the fish." This remark is incomplete. Such early releases would further exacerbate the competition problems with wild fish, as noted in our general comments and our comments on the Issaquah Fall Chinook HGMP. The risk of such premature releases requires to be quantified per NMFS guidelines for completing the HGMPs.

NMFS and the public need to know how often such releases have occurred in the past, how likely they are to occur, and how this risk has constrained the numbers of hatchery juveniles reared at the facility. Since the program needs to be reduced to meet Wild Salmonid Policy limitations on percentages of hatchery fish in natural spawning populations, the eight low ponds seem like a logical choice for elimination and this should be discussed under section 1.16.

Note:
Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

Rick's Pond Yearling Chinook Program HGMP
Comments submitted by Washington Trout
August 1, 2003
Prepared by Nick Gayeski

Section 1.8
This program is an integrated harvest program whose purpose (goal) is augmentation.
The response to this section consists of little more than asserting the goals of providing fish for harvest "while minimizing adverse effects on listed fish." It is asserted without any explanation or justification that adverse impacts will be minimized "by releasing yearling smolts with expected brief freshwater residency." As we have noted in our General Comments and elsewhere, these do not qualify as bona fide justifications for the program goals.

No justification is, therefore, provided in this section as required by NMFS. An adequately detailed justification should be phrased in terms of a motivation of potential benefits ensuing from the program, with the alleged benefits subsequently weighed against a credible quantitative estimate of the risks to listed species. Such a proper risk-benefit analysis should then be accompanied (in sections 1.9 and 1.10) by the specification of biologically relevant quantitative performance standards and indicators that are then connected to a comprehensive monitoring and evaluation plan specifying how program activities will be altered in an appropriate and timely manner when the monitoring data indicates that impact-containment thresholds have been exceeded.

Since this is an Isolated Harvest program that is based upon the creation of an artificial chinook life history that has never existed naturally in Puget Sound and Hood Canal, one would also expect that the non-biological benefits of such a program would have to be considerable in order to outweigh the palpable risks posed by this program to listed chinook in the Hood Canal. Unfortunately this is not the case. No attempt is made to provide a credible justification of this program in terms of socio-economic benefits that have been carefully weighed against biological risks to listed chinook.

Section 1.12
The response reports survival data for only one coded-wire tagged brood year (1995) of a modest 0.45. This survival rate would return approximately 5401 adults available for harvest from a planned release of 120,000 yearlings. This data should be discussed in terms of socio-economic benefit from the program, since this is the only raw material capable of providing a justification for the significant risks to which a yearling chinook program such as this will subject listed Hood Canal chinook.

Yearling chinook programs raise chinook to unnaturally large sizes (160 to 200 mm fork length, depending on condition factor) within one year. Such large individuals are readily capable of preying upon the largest wild juvenile chinook fingerlings present in Puget Sound and Hood Canal rivers and estuaries between the beginning of April and the end of June. This risk requires to be quantitatively estimated. In addition, these large hatchery chinook smolts can be expected to survive at significantly higher rates than hatchery fingerling smolts, rendering their numeric impact on wild chinook juveniles equivalent to anywhere from two to ten times that of the same number of hatchery fingerlings. Nowhere in the HGMP are these differential impacts on listed juveniles taken into account.

The Table accompanying section 1.10 (page 4), states the time of release of yearling smolts as May-June and the time of wild juvenile chinook outmigration as April through mid-June. This release will clearly occur when wild juvenile chinook are both rearing and migrating in the Hood Canal nearshore. There will be significant spatial and temporal overlap between the two creating significant opportunity for both competitive displacement and behavioral modification of listed juveniles and predation. This contradicts the statement in section 1.8 asserting that adverse impacts on listed fish would be minimized "by releasing yearling smolts with expected brief freshwater residency." The significant overlap in the Hood Canal nearshore itself is simply ignored.

Section 1.16

The section requires that alternative actions for attaining program goals be considered "and reasons why those actions are not being proposed." No response is provided. An obvious course of action in view of the nature of the program, the alleged and the largely unquantified benefits resulting from the program and the significant risks to listed chinook is to reduce or eliminate the program altogether. It appears that consideration of this and other alternatives would be mandatory to meet the requirements of this section. We do not believe that this HGMP can credibly qualify for take authorization without significant revision to this response.

Section 3.3.1
The response (pp. 13-14) reports catch distribution estimates as percentages of total return/catch for the 1995 brood year. Numbers caught by particular fisheries are not provided, nor is any economic data related to catch or fishing effort reported. Yet such data is fundamental to quantifying and evaluating the benefit to fisheries that it is alleged is the principal purpose and justification for the program. We do not believe that NMFS can credibly approve any HGMP that cannot present the evidence necessary to support the claim that the program produces benefits. At a minimum these must be characterized and then evaluated against the considerable risks to which yearling chinook programs subject listed chinook.

Section 3.5
The HGMP fails to describe the size of yearlings to be released, only fingerling smolt sizes are described and discussed. Yet the table in section 1.10 (page 4) lists the size at release of yearlings as 8 fish-per-pound, which is identical to the numbers per pound of yearlings from the Hood Canal program that are described in the HGMP for that program as "about 188 mm when wild Skokomish smolts are expected to be about 60 to 80 mm." The HGMP then continues by invoking the erroneous one-third body size length predation rules to attempt to dismiss the predation risk posed by yearling releases. "Given this rule of thumb …predation by hatchery smolts is not expected to be a significant problem." Two points are relevant here. First, even if the level is *expected* not to be significant NMFS still requires that the potential level of take be numerically estimated. Second, based upon the recent published research by Pearsons and Fritts (cited in our General Comments) demonstrating that coho and steelhead yearling smolts can prey upon and consume chinook fingerlings 46% of their body length, a yearling chinook smolt of an average length of 188 mm can consume a chinook fingerling 86 mm long, or larger than the expected average size of wild juvenile chinook expected to be rearing in the Hood Canal nearshore during the time that yearling releases occur. This clearly poses a significant risk and the HGMP has an obligation to estimate the level of take likely to result.

We note again that NMFS requires a numerical estimate of the take likely to result from each risk factor and hatchery activity. The HGMP fails to provide this in section 3.5 or elsewhere.

Note:
Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

Issaquah Summer Fingerling Chinook Program HGMP
Comments submitted by Washington Trout
August 1, 2003
Prepared by Nick Gayeski

Section 1.8
The HGMP fails to consider or address the unique juvenile rearing and migration circumstances of tributaries to Lake Washington. Both hatchery and wild juvenile Chinook are capable of rearing for extended period of time in Lake Sammamish and Lake Washington, after migrating out of native streams and prior to migrating out of Lake Washington. This is the only place in the entire ESU where there is extensive use of lakes by indigenous juvenile chinook. Seiler et al. (2003) show that wild chinook fry and fingerlings are moving out of the Cedar River, Bear Creek, and Issaquah Creek over a period of three months. These same fish will be rearing for varying periods in Lake Washington and Lake Sammamish. This creates the circumstances where severe competition between hatchery and wild juveniles is likely to occur, particularly in view of the considerable numbers of hatchery juveniles that outnumber wild juveniles by a factor of over 10.

In addition, the HGMP is silent about the implications of premature releases of hatchery fish. Seiler et al. (2003, page 138) determined that 28,000 hatchery chinook (and 32,000 coho) escaped prior to their planned release date in 2000. These fish would pose entirely different potential problems with respect to predation and competition than the planned releases, since these individuals would likely not be ready to migrate, would be more likely to residualize, would need to feed in the river and lake systems and would therefore be even more likely to prey upon and compete with smaller rearing salmonids, including listed chinook juveniles.

Section 1.16
Due to the likelihood of severe competition between juvenile wild and hatchery chinook in lake rearing habitats and the fact that this is a unique situation within the ESU, the program in question would appear to be very ill-advised. Spawning ground surveys in 2002 revealed a high straying rate of hatchery chinook to both the Cedar River and northern Lake Washington tributaries (Note: This was the first year in which all of the 3-year-old hatchery origin adults were marked). This should be expected on a regular basis since extended lake rearing probably reduces homing fidelity to individual streams.

It is also germane to note that virtually all of the harvest benefits from the program are realized in marine waters outside the system. This considerably diminishes, if not eliminates, the case for continuing this program at this location. The program should be eliminated or transferred to a location that does not pose serious problems for listed chinook.

Section 2.2
Paragraph beginning with “Most naturally-spawned Lake Washington chinook …” As noted in the comments above under Section 1.8, the assertions regarding the timing and duration of juveniles listed Chinook outmigration is incorrect and misleading. Moreover, no supporting documentation is referenced as requested by NMFS in the HGMP Template and Guidance document.

Pages 7-8. The HGMP states that “[r]ecent genetic testing (Marshall, 1999) of Bear/Cottage Lake Creeks (N. Lake Washington tribs) chinook imply that the population is a discrete, self-sustaining unit and are clearly distinct from the Cedar River chinook stock. It was also indicated that the Bear/Cottage Lake Creek stock is least differentiated from the Issaquah Hatchery (Green River lineage) population.” After noting this, the HGMP fails to discuss the conservation implications of this data and, specifically, the risk posed to this stock by the hatchery program. This data indicates that despite introgression from hatchery strays from the Issaquah hatchery, the Bear/Cottage Lake Chinook population has managed to retain a significant degree of its genetic identity but is under continue threat of loss of that identity from the Issaquah program. Elimination of the hatchery program would solve the serious straying problem with hatchery chinook of non-local origin. This should specifically be considered and evaluated under Section 1.16 as required by NMFS.

Further, we believe that this data supports the view that the wild fish in northern tributaries should be managed as a Category 1 population.

Section 2.2.2
The response states, "there are no direct estimates of hatchery-origin Chinook on the spawning grounds … It is assumed that a high percentage of natural spawners in Issaquah Creek are of hatchery origin." The 2000 releases were 1999 brood year fish many of which returned as 3-year-old adults in 2002. The serious straying problem has already been observed.

Section 3.5
We point out that competition and predation is not limited to the period "during their outmigration". This remark is erroneous and misleading, particularly in view of the very next sentence which state that "[r]ecent studies of the early life history and lake *residency* of Chinook in Lake Washington by the Muckleshoot Tribe illustrate the potential for competition between natural and Issaquah Hatchery Chinook (our emphasis)". In addition, despite NMFS requirement no numerical estimate of the potential level of take resulting from the considerable overlap in rearing and outmigration between wild and hatchery Chinook in the Lake Washington system is provided.

Section 10.11
We note again the extreme and misleading oversimplification and lack of supporting documentation regarding the impact of release timing on adverse impacts on listed fish.

Section 11.1.1
Describe plans and methods proposed to collect data necessary to respond to each "Performance Indicator" identified for the program.

The HGMP states "Also, need to monitor whether or not the smolts released from Issaquah Creek are migrating immediately to the Ballard Locks or are spending time in the Lake where they may be posing a risk to natural-origin chinook salmon." This remark implies that the duration of hatchery smolt migration and the likely harmful impacts of hatchery smolts on rearing wild juveniles is completely unknown. The issue should be stated as one of identifying the magnitude of the harmful impact. This would require the response to provide some actual details regarding the proposed study design for accomplishing the aims of this monitoring objective. This would also require that genuine, quantitative performance standards and indicators be fully and properly identified in section 1.9 and 1.10. The response also fails to acknowledge or address the recent studies by the Muckleshoot Tribe referred to in section 3.5.

Note:
Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

Hoodsport Creek Fall Fingerling Chinook Program HGMP
Comments submitted by Washington Trout
August 1, 2003
Prepared by Nick Gayeski

Section 1.8
This HGMP merely asserts putative goals (provide fish for harvest; minimize adverse effects on listed fish) where it is requested to provide explanatory *justification* for those goals. The response fails to even include the four or five boilerplate points used in the Wallace, Issaquah, Soos Creek, Voights Creek fall fingerling, and many other chinook and non-chinook HGMPs. In As in these other HGMPs, this response fails to provide any actual justification for the program.

This is a huge program, with a targeted release of 3,000,000 fingerling chinook directly into Hood Canal at a time when listed chinook juveniles from nearby rivers and streams will be rearing and migrating past. Since this is an Isolated Harvest program, one would expect that the non-biological benefits of such a program would have to be considerable in order to outweigh the palpable risks posed by this posed by the program to listed chinook from the Skokomish River and in other nearby rivers on the west side of Hood Canal. Unfortunately this is not the case. No alternative to present program operations are considered under section 1.16 as required by NMFS. No quantitative threshold standards for harmful impacts on listed chinook are identified and no performance indicators related to such standards are identified. Consequently, there is no monitoring evaluation plan identified or described appropriate to identifying harmful impacts much less identifying how program operations will be changed in the light of such monitoring data.

On page 4, in the table accompanying the response to section 1.10, the HGMP states “Our-migration timing of listed fish/hatchery fish, April thru early June/May”. This makes it clear that hatchery and wild chinook will be in direct competition in the near shore marine waters of Hood Canal.

On page 5, point #3 under “Benefits addressed” lists “Meet Endangered Species Act recovery requirements and Wild Salmonid Policy guidelines.” While these are indeed appropriate goals for this program, this review frankly finds if difficult to regard this response as other than disingenuous in this context, if not an attempt to mislead. The Hood Canal chinook situation is easily the worst in the entire ESU in terms of violating Wild Salmonid Policy guidelines.

High stray rates are an acknowledged problem in the basin, that carry acknowledged significant risks of harmful genetic and ecological impacts on listed chinook. Wild Salmonid Policy guidelines limit the proportion of hatchery fish in natural spawning populations to 5% to 10% or less. Instead, in watersheds impacted by this program the percentage of wild fish in natural spawning populations is probably only about 5% to 10%. The HGMP fails to translate its alleged desire to comply with Wild Salmonid Policy guidelines into a clear quantitative monitoring plan, much less specify how the results of such a regular monitoring plan will be translated into well-defined changes to the program that will accelerate or increase the probability of achieving compliance with the Policy, particularly considering how far from compliance the program currently is. As already noted, section 1.16 contains no discussion of any alternative actions for achieving this goal.

At the bottom of page 5 under “Risks Addressed” it is stated “1) Reduce hatchery broodstock collection impacts on wild fish by; initiating mass marking of hatchery chinook and; returning wild fish entering the hatchery back to the river or stream.” In this case, the wild fish would have to be released back into the marine waters of Hood Canal. This would appear to be inadequate, since such fish have homed to the Hoodsport hatchery waters either after migrating past home rivers north of Hoodsport or having encountered natal stream water south of Hoodsport. There would appear to be little likelihood of such fish getting it right the second time after being released back into Hood Canal. Further discussion and a more complete description of the intended action is required.

Section 1.10.2

"2. Document spatial and temporal distribution of hatchery chinook in the nearshore marine areas immediately after release. Adjust release strategies, if needed, to reduce interactions with wild fish." There is no quantitative performance *standard* to which this presumed indicator is linked. As noted in our general comments and elsewhere, this is not in fact an indicator. It is a possible condition that could be measured and that could serve as an indicator for some related and appropriate quantitative standard.

What is required at a minimum is a statement of the kinds of interactions between hatchery and wild fish in the nearshore that it is desirable to limit or avoid and a description of how spatial and temporal overlaps in the distributions of hatchery and listed juvenile chinook in nearshore marine areas after release result in those interactions. In the absence of a clear description of a quantitative limit standard for the interactions, there is no way to determine the kind of monitoring and indicator appropriate.

At any rate, it is not clear what corrective action could be taken, short of significantly reducing the scale of the hatchery releases. "Adjusting" release strategies would appear to be obfuscatory in the present context. It is reasonably clear that there is little flexibility to the timing of hatchery fingerling releases from the Hoodsport facility. They cannot be released earlier due to conflicts with wild summer chum juveniles; and they cannot be released much later. The only *bone fide* adjustment worth considering is program reduction. If there is a genuine desire to conduct research to better determine the magnitude of overlap and interaction between Hoodsport fingerling and listed juvenile chinook in the Hood Canal nearshore, it should be acknowledged that the most appropriate management response to results that indicate an unacceptable level of interactions is program reduction.

Section 1.16
In view of the considerable size of the proposed releases and the current condition of listed chinook and summer chum in Hood Canal, it seems clear that a reduction in the current and planned scale of this program is in need of urgent consideration. The consideration of program reduction together with a detailed discussion of reasons for rejecting program reduction should be presented in this section. The failure to provide any answer appears to violate NMFS direction for completing the HGMP.

Section 2.2.1
"Because there is no specific information on wild smolt temporal and spatial distribution in Hood Canal streams, the extent to which they might interact with hatchery chinook released locally is unknown." This remark is incomplete. The real issue is perhaps better put as "is the extent to which they might interact with hatchery chinook released locally likely to be significant enough to be of concern from the point of view of the ESA?" The answer to this is surely "yes."

In any case, detailed information on what is known regarding timing of outmigration and hatchery releases should be discussed. For this particular program, the only question is direct marine area competition and it is a certainty that such competition does occur. There is no uncertainty that the timing of listed juvenile migration into Hood Canal overlaps considerably with the timing of hatchery releases. The only question appears to be the exact extent of spatial overlap in nearshore areas and the magnitude of harmful interactions of hatchery juveniles with listed juveniles.

Section 3.5
The HGMP states "Hoodsport chinook smolts are released at a size of about 80 to 100 mm in May when wild Skokomish smolts are expected to be about 60 to 80 mm long". The size disparity favoring hatchery fish will further exacerbate the competition between hatchery and wild chinook. In addition, the smaller wild fish will be available to more predators. It is also worth pointing out that the HGMP employs the erroneous one-third body length rule-of-thumb for estimating the maximum body length upon which chinook can prey, ignoring the evidence from Pearsons and Fritts 1999 (discussed in our General Comments and our detailed Comments on the Wallace Fall Fingerling HGMP) and the Department's own predation risk modeling efforts.

Page 17, "Table 22". This table displays the huge disparity between estimated wild smolts entering Hood Canal and the combined releases of hatchery fingerling smolts and yearlings by the George Adams and Hoodsport facilities. The ensuing discussion of predation and competition risks acknowledges that the

circumstances for significant competition exists, but nowhere in the HGMP is a quantitative estimate of the potential take made as required by NMFS' HGMP Template guidance document.

Note:
Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

Hood Canal Yearling Chinook Program HGMP
Comments submitted by Washington Trout
August 1, 2003
Prepared by Nick Gayeski

Section 1.8
This program is an integrated harvest program whose purpose (goal) is augmentation.
The response to this section includes four of the five boilerplate points common to Puget Sound fingerling programs, which as noted in our General Comments and elsewhere, fails to qualify as justifications for the program goal.

No justification is, therefore, provided in this section as required by NMFS. What is required is a detailed *justification* phrased in terms of a motivation of potential benefits ensuing from the program, with alleged benefits subsequently weighed against a credible quantitative estimate of the risks to listed species. Such a proper risk-benefit analysis should then be accompanied (in sections 1.9 and 1.10) by the specification of biologically relevant quantitative performance standards and indicators that are then connected to a comprehensive monitoring and evaluation plan specifying how program activities will be altered in an appropriate and timely manner when the monitoring data indicates that impact-containment thresholds have been exceeded.

Since this is an Isolated Harvest program that is based upon the creation of an artificial chinook life history that has never existed naturally in Puget Sound and Hood Canal, one would also expect that the non-biological benefits of such a program would have to be considerable in order to outweigh the palpable risks posed by this posed by the program to listed chinook in the Hood Canal. Unfortunately this is not the case. No attempt is made to provide a credible justification of this program in terms of socio-economic benefits that have been carefully weighed against biological risks to listed chinook.

Section 1.12
The response states that the "[f]ishery and survival data from this program is limited at this time due to the newness of the program" and proceeds to report estimated survival for brood years 1994 to 1996 (0.12%, 1.13%, and 0.10% respectively). No reason is given why data for later brood years are not reported although escapement data and broodstock levels back to the hatchery rack are given for 1995 through 2001. The survival data for the 1994 and 1996 brood years is extremely poor and would translate into approximately 300 adults available for harvest from a planned release of 250,000 yearlings. This data should be discussed in terms of socio-economic benefit from the program, since this is the only raw material capable of providing a justification for the significant risks to which a yearling chinook program such as this will subject listed Hood Canal chinook.

Yearling chinook programs raise chinook to unnaturally large sizes (160 to 200 mm fork length, depending on condition factor) within one year. Such large individuals are readily capable of preying upon the largest wild juvenile chinook fingerlings present in Puget Sound and Hood Canal rivers and estuaries between the beginning of April and the end of June. This risk requires to be quantitatively estimated. In addition, these large hatchery chinook smolts can be expected to survive at significantly higher rates than hatchery fingerling smolts, rendering their numeric impact on wild chinook juveniles equivalent to anywhere from two to ten times that of the same number of hatchery fingerlings. The 250,000 yearling proposed to be released into Finch Creek from the Hoodsport hatchery facility will be equivalent to 500,000 to more than one million fingerlings. Nowhere in the HGMP are these differential impacts on listed juveniles taken into account.

The Table accompanying section 1.10 (page 4) , states the time of release of yearling smolts as June. This release will occur when wild juvenile chinook are both rearing and migrating in the Hood Canal nearshore. There will be significant spatial and temporal overlap between the two creating significant opportunity for both competitive displacement and behavioral modification of listed juveniles and predation. NMFS requires that a numerical estimate of the resulting take be estimated. The HGMP steadfastly refuses to provide this in section 3.5 or elsewhere.

In section 3.5 the HGMP states that “smolts are released at a size of about 188 mm when wild Skokomish smolts are expected to be about 60 to 80 mm” and then relies upon the erroneous one-third body length predation rules to attempt to dismiss the predation risk posed by yearling releases. “Given this rule of thumb …predation by hatchery smolts is not expected to be a significant problem.” Two points are relevant here. First, even if the level is *expected* not to be significant NMFS still requires that the potential level of take be numerically estimated. Second, based upon the recent published research by Pearsons and Fritts (cited in our General Comments) demonstrating that coho and steelhead yearling smolts can prey upon and consume chinook fingerlings 46% of their body length, a yearling chinook smolt of an average length of 188 mm can consume a chinook fingerling 86 mm long, or larger than the expected average size of wild juvenile chinook expected to be rearing in the Hood Canal nearshore during the time that yearling releases occur. This clearly poses a significant risk and the HGMP has an obligation to estimate the level of take likely to result.

Section 1.16
No response is provided. An obvious course of action in view of the nature of the program, the alleged and the largely unquantified benefits resulting from the program and the significant risks to listed chinook is to reduce or eliminate the program altogether. It appears obvious that consideration of this and other alternatives in this section of the HGMP is mandatory. We do not believe that this HGMP can credibly qualify for take authorization without significant revision to this response.

Note:
Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

George Adams Fall Fingerling Chinook Program HGMP
Comments submitted by Washington Trout
August 1, 2003
Prepared by Nick Gayeski

Section 1.8
This HGMP fails to employ the 5 boilerplate points used in the Wallace, Issaquah, Soos Creek, and Voights Creek fall fingerling chinook HGMPs. Instead it merely asserts putative goals (provide fish for harvest; minimize adverse effects on listed fish) where explanatory *justification* is requested for those goals. The response fails to provide any bona fide justification for the program.

Like the Hoodsport Fall Fingerling program, this is a huge program that would appear to pose even greater threats to listed chinook and summer chum than does the Hoodsport program. The program has a targeted release of 3,800,000 fingerling chinook into a tributary of the Skokomish River that has a listed chinook population. In addition to the basic concerns raised in our comments on the Hoodsport program, this program poses threats of direct competition and predation to rearing and outmigrating listed chinook juveniles that are estimated to number little more than 100,000.

Since this is an Isolated Harvest program, one would expect that the non-biological benefits of such a program would have to be considerable in order to outweigh the palpable risks posed by this posed by the program to listed chinook from the Skokomish River and in other nearby rivers on the west side of Hood Canal. Unfortunately this is not the case. Section 3.3.1 requires that fisheries benefiting from the program be identified and harvest levels and rates for the past twelve (12) years provided. After admitting that "George Adams fall chinook CWT survivals have been low (<1%) for many years"(page 14), the HGMP proceeds merely to list the fisheries in which catches of George Adams hatchery fish have occurred. No numbers are provided. No socio-economic benefit is described and evaluated that could be weighed against the significant risks the program poses to listed fish.

No alternative to present program operations are considered under section 1.16 as required by NMFS. No quantitative threshold standards for harmful impacts on listed chinook are identified and no performance indicators related to such standards are identified. No monitoring/evaluation plan is described appropriate for identifying harmful impacts much less identifying how program operations will be changed in the light of such monitoring data.

On page 5, in the table accompanying the response to section 1.10, the HGMP states "Our-migration timing of listed fish/hatchery fish, April thru early June". This makes it clear that hatchery and wild chinook will be in direct competition in the near shore marine waters of Hood Canal.

Section 1.16
In view of the considerable size of the proposed releases and the current condition of listed chinook and summer chum in Hood Canal, it seems clear that a reduction in the current and planned scale of this program is in need of urgent consideration. The consideration of program reduction together with a detailed discussion of reasons for rejecting program reduction should be presented in this section. The failure to provide any response appears to violate NMFS direction for completing the HGMP.

Section 2.2.1
"Because there is no specific information on wild smolt temporal and spatial distribution in Hood Canal streams, the extent to which they might interact with hatchery chinook released locally is unknown." This remark is incomplete. It is not sufficient to raise such a point and then drop it. The real issue is perhaps better put as "is the extent to which they might interact with hatchery chinook released locally likely to be significant enough to be of concern from the point of view of the ESA?" The answer to this is surely "yes" In any case detailed information on what is known regarding timing of outmigration and hatchery releases should be discussed. It is a near certainty that competition occurs with rearing and migrating listed juveniles in freshwater and in Hood Canal itself. There is no uncertainty that the timing of listed juvenile migration into Hood Canal overlaps considerably with the timing of hatchery releases. The only

question appears to be the exact extent of spatial overlap in nearshore areas and the magnitude of harmful interactions of hatchery juveniles with listed juveniles.

Section 2.2.3
The section requests the HGMP to provide "*projected* annual take levels for listed fish by life stage (juvenile and adult) quantified (to the extent feasible) by the type of take resulting from the hatchery program" (our emphasis). It seems clear from NMFS' language in the Template and in the guidance document that credible estimates of the range of numerical take likely to occur as a result of hatchery operations and practices (including the release of juveniles themselves) be provided when exact numbers cannot. The HGMP fails to do this and, instead, satisfies itself with listing "unknown" in the associated take table (Table 1). This is clearly incomplete and unacceptable.

Section 3.5
The HGMP admits that "actual stream residence time and freshwater competition between George Adams chinook and Skokomish-basin chinook have not been examined" and proceeds to state that George Adams hatchery "smolts are released at a size of about 80 to 100 mm in May when wild Skokomish smolts are expected to be about 60 to 80 mm long". The size disparity favoring hatchery fish will further exacerbate the competition between hatchery and wild chinook. In addition, the smaller wild fish will be available to more predators. It is also worth pointing out that the HGMP employs the erroneous one-third body length rule-of-thumb for estimating the maximum body length upon which chinook can prey, ignoring the evidence from Pearsons and Fritts 1999 (discussed in our General Comments and our detailed Comments on the Wallace Fall Fingerling HGMP) and the Department's own predation risk modeling efforts.

The several conditions that make it highly likely that adverse competitive impacts on listed chinook juveniles will occur as a result of hatchery program releases requires to be critically examined and discussed in a risk-assessment and risk-containment context, not discounted or dismissed as "unknown".

Page 17, "Table 22". This table displays the huge disparity between estimated wild smolts entering Hood Canal and the combined releases of hatchery fingerling smolts and yearlings by the George Adams and Hoodsport facilities. The ensuing discussion of predation and competition risks acknowledges that the circumstances for significant competition exists, but nowhere in the HGMP is a quantitative estimate of the potential take made as required by NMFS' HGMP Template guidance document.

Note:
Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

Green River/Soos Creek Coho Program HGMP
Comments submitted by Washington Trout
August 1, 2003
Prepared by Nick Gayeski

Sections 1.7 and 1.8
This is a large coho production program releasing 600,000 fingerling smolts on station and an additional 350,000 fry in tributaries in the Green River basin (Section 1.10 Table, page 4).

The program is characterized as an augmentation program whose purpose is "to provide harvest opportunity." In addition, section 1.8 implies that "minimizing adverse genetic, demographic or ecological effects on listed fish" is also a second (an apparently secondary) program goal. This goal needs to be clearly stated and explained in appropriate detail in this section, essentially at the beginning of the HGMP.

Section 1.8 fails to provide any justification for the general program purpose (harvest augmentation) or for this particular coho production program. Rather, it merely states some features of the rearing and release of hatchery fish. No motivation is provided in regard to the following implicit fundamental questions: *Why is harvest augmentation an appropriate or valid goal? Why does it need to occur at the Soos Creek facility or even within the Green River Basin? Why is it socially, economically, or biologically necessary, advisable, or even beneficial to provide fish for harvest using this program at this facility?* Perhaps WDFW takes it for granted that providing fish for harvest is justification in itself, but NMFS should not have to when evaluating this program, nor, certainly, should the public.

There likely are several and varied justifications for providing fish for harvest. They should be listed and described in sufficient detail to be evaluated and weighed objectively against all direct and indirect take of listed species likely to occur as a result of the program.

Further, taking for granted some general need for "fish for harvest" provides no kind of justification for any particular program, including Soos Creek. Presumably, "fish for harvest" can be provided in any number of ways at any number of places. This response should describe why it is necessary to produce coho smolts for harvest at Soos Creek under the specific protocols proposed – again, in order that such justification can be *weighed against* the risk of potential take that may occur, relative to other options, including discontinuing or scaling back the program.

Presumably, relative to take authorization, the standard of justification for a coho harvest augmentation program should be higher than for a chinook recovery, preservation/conservation, or research program, or at least different. One should expect at best a very low level of biological "benefit" from a harvest/augmentation program. Therefore, a relatively high level of social and/or economic "benefit" should be described in detail in order to justify any biological risks of the program to listed Puget Sound chinook. The description should include information about the social or political obligation for the program, identify affected stakeholders, explain the program's success at providing the expected benefits, and/or supply numerical estimates of the economic activity that can be directly attributed to program activities.

Such benefits should be summarized here and described in greater detail in section 3.3.1. Unfortunately the response in section 3.3.1 consists of a single sentence merely asserting the fish from the program "contribute to recreational and commercial fisheries in Puget Sound as well as fisheries in Canada" (page 10).

WDFW appears to assume one or both of two things: that because the existing Soos Creek Coho Program predates the listing of Puget Sound Chinook, the "benefit" of raising fish for harvest at Soos Creek has already been established, and should not require detailed explication; or that the assertion that the existing program will be run (or has been run) in order to "minimize adverse… effects on listed fish" is adequate to justify continuing the program. To be fair, guidance offered by NMFS in the HGMP

template could be interpreted to imply as much. Nevertheless, Washington Trout considers both of these assumptions counterintuitive, and a misreading of both the spirit and the specific requirements of the 4d Rule and the HGMP template.

At any rate, the response for this subsection of the HGMP lacks detail sufficient to assure that the program will result in "adverse genetic, demographic or ecological effects on listed fish" being contained within quantifiable limits that can reasonably be considered to be "safe." The mere assertion that the Department's intention is to provide fish for harvest "while minimizing adverse… effects on listed fish" is insufficient.

The HGMP Template provides guidance that directs applicants to describe, "*how* the program will be operated to provide fish for harvest while minimizing adverse effects on listed fish." (Emphasis added.) The WDFW response merely asserts that it *will* operate the program thus (in language lifted nearly verbatim from the template). In order to meet the HGMP requirement to adequately describe how WDFW will accomplish these goals, quantitative standards that provide clear threshold levels of potential adverse impact to be avoided need to be stated, and then clearly linked to quantitative monitoring variables.

Sections 1.9 and 1.10

Performance standards and indicators and associated Monitoring and Evaluation plans are listed in the Table on pages 3 – 6 titled "Performance Standards and Indicators for Puget Sound Integrated Harvest Coho programs". As we have discussed in some detail in our comments on the Fingerling Chinook program HGMPs, these fail to be stated as quantifiable measures and they lack any explanation or justification demonstrating their suitability for the task that they are intended to serve.

For example, page 5 states as a Performance Standard "minimize interactions with listed fish through proper rearing and release strategies". This is not a performance standard but more a re-statement of a program goal. A *standard* would specify a quantifiable, numerical metric that pertains biologically to one or more of the kinds of adverse impact that the rearing and/or release of coho juveniles can have on listed fish.

Be this as it may, none of the items listed under the heading Performance Indicator corresponding to the purported standard is clearly stated as an indicator nor is any one of them obviously relevant to the goal (not a standard) of minimizing adverse interactions with listed fish. A modicum of biologically relevant argumentation is required to make a case for the relevance of these items, and such argument is not made in this HGMP.

The remarks under the heading Monitoring and Evaluation Plan corresponding to this standard ("Minimize interactions with listed fish through proper rearing and release strategies") contain no measurable criteria and no actions associated with attempts to measure impacts of hatchery releases on listed juveniles. Nor do they contain or reference any timeline for changing program actions so as to endeavor to come into compliance with a *bone fide* standard.

The performance indicators listed are "[j]uveniles released as smolts"; "[o]utmigration timing of listed fish/hatchery fish - /May"; "[s]ize and time of release – 17 fpp with April release (600,000); 600 fpp with May release (350,000)"; and, "[h]atchery stray rates". These are closer to being standards than they are to being measures that can serve to indicate whether or not a standard is attained.

Only the number and size of release contain measurable quantities. Most importantly, no explanation is provided that explains *how* such measurements (or potential measurements) are biologically relevant to the *goal* (not standard) of minimizing interactions with listed fish. No discussion occurs anywhere in the HGMP to describe how such putative indicators have been or will be employed in guiding and modifying program activities. No detailed monitoring plan employing such indicators and adhering to a biologically relevant timeline is described.

The associated Performance indicator of 17 fpp raises another important issue for this and all HGMPs. Fish-per-pound is hatchery management jargon and not clearly understood by the public. Moreover, where length is of direct relevance to issues such as predation and competitive interactions between coho and chinook juveniles, number per pound cannot be directly translated into length or weight without specification of the condition factor of the released fish. We therefore recommend, first of all, that the Fulton condition factor, K (=W(grams)*100/(L(cm)^3) be reported together with both the number of fish per pound and the length in centimeters or millimeters that is associated with the number per pound at the given condition factor. Second of all, we recommend that the distribution of condition factor, length, and numbers per pound be provided for all hatchery releases discussed in the HGMP. Information about the size range of released hatchery juveniles in conjunction with the size distribution of rearing and migrating listed juveniles is critical in estimating the likely adverse impacts of hatchery releases.

In brief, these two sections (1.9 and 1.10) fail to comply with the HGMP Template and NMFS guidelines for completing the Template.

Section 1.16
The response to the HGMP is “NA”. It is simply false that this subsection is “not applicable.” It is incumbent on the HGMP to list and discuss reasonable alternatives to the proposed program that may better satisfy one or more of the program goals, particularly the presumably over-arching goal of eliminating or minimizing adverse impacts on listed fish.

Clearly, one possible alternative is to considerably reduce the size of the releases. (600,000 fingerling smolts are proposed to be released.) This has recently been done in the Snohomish River basin. The Wallace River Fall Fingerling Chinook HGMP contains the following statement: “Yearling coho production at Wallace River has been reduced from 300,000 to 150,000 recently. This reduction may help to minimize competition and predation interactions between hatchery coho and naturally produced chinook.” The Snohomish River basin is larger in physical size than the Green River basin and has a total returning adult chinook spawning population no larger and generally less than that of the Green. Yet 300,000 fingerling coho (also released at a size of 17 fpp) released from a comparable point within its river basin to Soos Creek has evidently been admitted by the co-managers to have been too large in view of *potential* risks posed to the listed chinook population.

While we have concerns with the size and operation of this reduced program in the Snohomish River basin, it is relevant in the present context that this program was reduced from a size that was half that of the present and proposed Soos Creek coho program in the Green River, which is comparable in geographic size and in the size of its listed chinook population to the Snohomish river basin. Clearly, program reduction is a viable option and should be discussed in section 1.16. This appears to us to be a serious deficiency of this HGMP.

Section 2.2.3
The response states, in part, that "release of fish described in this HGMP could potentially result in ecological interactions with listed species. The potential ecological interactions are discussed in Section 3.5, and risk control measures are discussed in Section 10.11” (page 9). The HGMP template requests that “annual take levels for listed fish by life stage” be provided. The HGMP refers readers to the associated take table (Table 1) at the end of the HGMP (page 33) where the unintentional lethal take of egg-fry, juvenile/smolt, and adults is listed simply as "unknown".

No attempt is made to estimate the level of this suspected take, yet this is what is explicitly requested by NMFS in the HGMP Template and in the HGMP Completion Guidelines dated January 5, 2000. Guideline G is especially relevant:

> Under the broad definition of ESA, "take", of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of listed fish. When "take" of a listed species is expected in the hatchery operation, the ESA **requires** that a numerical estimate be quantified as best as possible. (emphasis added)

Merely listing "unknown" fails to qualify as providing a numerical estimate as best as possible.

Section 3.3
Subsection 3.3.1 of the HGMP template requests a description of "fisheries benefiting from the program" as well as "harvest levels and rates for program-origin fish for the last twelve years (1988-1999), if available." In response, it is asserted that program fish contribute to “recreational and commercial fisheries in Puget Sound as well as fisheries in Canada”. This response is far too cursory.

In the context of the ESA and the listing status of Puget Sound chinook, it is the alleged benefits to fisheries of program releases that are being weighed against the myriad of risks to listed fish of hatchery operations. This is especially true in the case of isolated harvest programs such as the Soos Creek Coho program. The HGMP template specifically requests data and detail to quantify an assertion that any particular hatchery program is providing such benefits.

In particular, numbers caught by particular fisheries are not provided, nor is any economic data related to catch or fishing effort reported. Yet such data is fundamental to quantifying and evaluating the benefit to fisheries that it is alleged is the principal purpose and justification for the program. It is difficult to understand how NMFS can approve an HGMP that does not present any detailed evidence necessary to support the claim that the program produces benefits. At a minimum these must be characterized and then evaluated against the considerable risks to which a coho fingerling smolt program may subject listed chinook.

It is also important for an HGMP to note when data are lacking or inadequate to permit a reliable estimate to be made of the quantitative contribution of program fish to the fisheries that program releases are being targeted to benefit. When this is the case it would, further, seem necessary and appropriate for the HGMP to explain how the program proposes to address the problem of lack of data.

The cursory and inadequate response gives the impression that program managers believe either that it is obvious that the hatchery program provides fishery benefits that outweigh risks to listed stocks or the appropriate default presumption is that a hatchery program provides such benefits until proven otherwise. In the context of the ESA this is decidedly not the appropriate presumption. To the contrary, the HGMP process and NMFS would appear to be requesting that quantitative evidence be provided of the fishery benefits actually provided by a particular hatchery program. The HGMP patently fails to provide this evidence.

Further, the response fails completely to address the guidance in the HGMP Template that directs the applicant to explain how or if artificial production and harvest management have been integrated.

Section 3.5
Compared to the chinook HGMPs, the Coho and Steelhead HGMPs endeavor to more completely discuss issues related to nutrient enhancement, competition, and predation. Despite the additional discussion the HGMP fails to adequately acknowledge the likelihood of risk to listed chinook from releases of coho fingerlings and reflects several erroneous assumptions regarding juvenile chinook rearing and migration that are common to the chinook HGMPs.

The HGMP continues to rely upon the erroneous and dated one-third body size rule of thumb. The recent peer-reviewed published study by Pearsons and Fritts (1999) that demonstrates that coho fingerling smolts are capable of *successfully* preying upon and *consuming* juvenile chinook 46% of their own body length is mentioned and then ignored without any discussion. This is despite the fact that WDFWs own Salmonid Stock Conservation Science Unit has been developing and refining a predation model for use in assessing hatchery-related risks of just the kind at issue in this HGMP that explicitly incorporates the 46% figure as the appropriate rule of thumb! In addition the HGMP fails to mention that in the same study Pearsons and Fritts documented fingerling coho smolts attacking and *attempting* to consume and *killing* as a result of the attempts juvenile chinook up to 58% of their body length.

At 17 fish-per-pound and a condition factor of 1 (the general target K-factor for WDFW hatcheries), the average coho fingerling would be 139 millimeters long and would therefore be capable (using Pearsons and Fritts data) of consuming juvenile chinook 64 millimeters and capable of attacking and killing chinook 80 millimeters long. These sizes are squarely within the range of *average* lengths of actively downstream migrating juvenile chinook listed in Table 3.5.1 of the HGMP (page 12) for statistical weeks 16 through 19, which brackets the time during which program coho fingerlings are proposed to be released.

Moreover, the data provided in Table 3.5.1 do not fully or adequately reflect the risk of predation by released coho fingerling smolts on listed chinook juveniles. This data is average size data only for chinook that are actively migrating downstream. These are the ones that are caught in the migrant traps. Smaller fish still rearing and/or not actively migrating are still present along the migration corridor. In other words, the juvenile chinook sizes from traps reported in Table 3.5.1 at best provide an index of the maximum size of chinook present that might be subject to predation, displacement, and other kinds of competition.

For both the case of actively migrating juvenile chinook caught in migrant traps and the case of non-migrating juveniles size (length) distributions need to be considered and should be provided. Even if the shape of the size distribution is assumed to be normal, there will likely be a significant left-hand tail to the size distribution containing significant numbers of smaller fish. If, as is more likely, the distribution is not normal but skewed to the right, the *mode* of the size distribution will be somewhere to the left of the mean (average) size; in this case, the length interval containing the greatest number of individuals will be composed of fish smaller than the average size. In as much as the purpose of considering this kind of data is to attempt to *quantify* the potential level of take *per* paragraph “G” of NMFS HGMP guidance, these length distributions need to be estimated and appropriately risk-averse estimates of the numbers of listed juvenile chinook of vulnerable sizes present along the migration corridor employed.

The HGMP appears to merely go through the motions of considering competition and predation of coho smolts on listed juveniles. It relies upon assumptions such as the one-third length rule of thumb and misleading summary data (the average size data from the migrant traps) that *minimize* the potential predation and competition risks. In addition, in relying upon the one-third size rule the HGMP ignores recent research (conducted by WDFW’s own employees) that demonstrates that the one-third rule is inappropriate. After having done this, the HGMP still refuses to provide a *numeric estimate* of the potential level of take that is likely to result from the proposed releases.

In the context of the ESA it seems clear to Washington Trout that when faced with genuine uncertainty as to a potential harmful effect of a hatchery practice -- resulting either from lack of data and lack of past research, or from uncertainty regarding biological mechanisms involved in potentially harmful inter- and intra-specific interactions -- when estimating the potential level of the harmful impact assumptions be employed that risk over-estimating the level of take, rather than risk under-estimating it! In other words, the estimation process ought to be more concerned with providing reasonably high power (low probability of making a Type II error) than with keeping the probability of making a Type I error low for a null hypothesis that hatchery releases cause no take. The HGMP is simply more concerned with wrongly over-estimating a level of take from predation by hatchery smolts than it is with failing to guard listed juvenile chinook against the credible risk of take from predation by hatchery smolts. As with most of the numerous factors responsible for the decline and listing of salmonid populations under the ESA, the listed resource is forced to bear the full burden of the uncertainty. This would appear to be patently illegal.

Section 10.11
The response merely asserts that to “minimize the risk of residualization and impact upon natural fish, hatchery yearlings are released in April as smolts. All fish released will be mass marked” (page 25). This response is clearly inadequate for several reasons. It simply begs the question that “minimization” is tantamount to “reduction to a level below that which constitutes take”. This requires to be explained and demonstrated! The “minimization” that is believed to result from the practice needs to be quantified. As

discussed above in regard to section 3.5 there is evidence for considerable risk of competition and outright predation on listed juvenile chinook from the smolt releases at issue in this HGMP.

This refusal to seriously endeavor to quantify the level of take, common in all other HGMPs we have reviewed, implies a cavalier attitude toward the HGMP process and towards the genuine risk that hatchery operations can pose to listed fish. NMFS cannot credibly approve any HGMP that refuses to provide the modicum of detail necessary to characterize the risks that the HGMPs are intended to assist NMFS to evaluate, and that appear to fail to take the obligation to do so seriously.

The response implies that releasing hatchery smolts in April will effectively segregate the hatchery coho juveniles from emigrating wild chinook smolts, minimizing potential adverse interactions. This grossly over-simplifies the temporal distribution of the migration of wild listed juveniles from freshwater to saltwater habitats. Recent data on the timing of wild juvenile chinook outmigration in mid-Puget Sound rivers gathered by the Department's own Wild Salmon Production Evaluation Unit (WSPE) (Seiler et al. 2001(a), 2001(b), 2001(c), 2002, and 2003) provides substantial evidence that wild juvenile chinook downstream migration generally occurs over a protracted period of time ranging from February to July. The majority of this data is noteworthy in displaying no pronounced mode in the timing of wild chinook outmigration. Rather, outmigration appears to be more or less continuous with several small modes scattered from mid-March to mid-June. This makes it extremely unlikely that hatchery smolt releases can be scheduled to occur after wild emigration unless hatchery releases occur after late July.

The response fails to acknowledge current work that strongly suggests hatchery and wild juvenile chinook are commingling in near-shore habitats in Puget Sound for significant periods of time before migrating to the open ocean, any attempt at temporal segregation during emigration from upstream, freshwater habitats notwithstanding. Early data from beach-seine and surface-trawl sampling in Skagit Bay in 2002 demonstrate that wild chinook juveniles of various age and size classes are present together in significant ratios throughout the spring, summer, and fall, in several types of estuarine and near shore habitats. Sampled hatchery-marked juveniles are mixed with unmarked juveniles in mean percentages ranging from 10% to nearly 60% from May through November (personal comm., Casey Rice, NMFS; 2003). During the periods that wild juveniles are present in these near shore environments, any commingled hatchery juveniles may enjoy several competitive advantages over their wild counterparts, including most significantly size, which may contribute to create a significant risk of adverse interactions and impacts to listed chinook, including competition, displacement, and predation. WDFW is aware of these preliminary findings and should understand their implications. These data, while still inconclusive and not directly related to coho presence (wild or hatchery) in nearshore habitats, should warrant some discussion and analysis in this context, insofar as WDFW is asserting that it can successfully minimize adverse impacts to listed Puget Sound chinook by effectively segregating listed chinook juveniles from hatchery juveniles of all species during freshwater out-migration and rearing life stages.

Section 11.1
This response in this section consists principally of assertions that the co-managers conduct some "ongoing monitor (sic) programs, including catch, escapement, marking, tagging, and fish health testing" and statements of intentions to conduct future research on aspects of juvenile salmon ecology and research to assess the risks of predation on listed species by hatchery coho and steelhead. While this is surely well and good, it fails to address in detail the specific performance standards and indicators listed in section 1.9 and 1.10. Such an endeavor is surely hampered by the fact noted in our comments on those sections that no *bone fide* standards or indicators are provided.

What seems to be required here and is fundamentally missing is a detailed description of the kinds of monitoring currently going on or planned to occur in the immediate future with regard to specific quantitative standards and indicators, especially those pertaining to risk of harm to listed fish. Without a clear account of what kinds of things need to be measured and what the target levels of each are, it is impossible to understand what features or practices of the program could be changed in order to bring about compliance with target levels (standards). Without knowledge of what *could* be changed in order

to bring about achievement of (compliance with) a standard neither NMFS nor the public can attain a clear idea of what *would* be changed. Absent this, there simply are no standards.

The mere statement of the intention to monitor or conduct research without any substantive details is not in any way an equivalent or an acceptable substitute for a clear quantitative monitoring plan, which specifies both the kinds of program changes that will occur or will be evaluated in response to specific monitoring data and the *period of time* within which such changes will occur and quantitative threshold performance standards will be achieved. The HGMP provides no such detail. It effectively describes no monitoring plan and it has no timelines.

Section 11.2
The fundamental shortcomings noted under section 11.1 are further evidenced by the response to this section, which consists entirely of the statement that "[r]isk aversion measures will be developed in conjunction with monitoring and evaluation plans" (page 26). In other words, there currently are *no* risk aversion measures because there currently appears to be no detailed monitoring and evaluation plan.

This is more than a little disturbing. It would seem to reveal that the implicit program goal suggested in section 1.8 of "minimizing adverse genetic, demographic or ecological effects on listed fish" is not an operative goal or objective at all. The response clearly and simply suggests that there are no currently operative risk aversion standards regarding adverse impacts of hatchery practices on listed fish.

Risk aversion measures should be *implicit* in the specification of quantitative performance standards and indicators, if not explicit! If clear quantitative performance standards and indicators were provided in sections 1.9 and 1.10 as required by NMFS in the HGMP Template and associated Guidance, the appropriate risks to be avoided would be implicitly those required in order to attain the standards! Attainment of the standards, in turn, is evidenced by the attainment of specific levels in the indicators which figure directly in monitoring plans. The monitoring and evaluation plans would be structured by the very statement of quantitative standards and indicators. NMFS requires that these be articulated in section 1 of the HGMP.

This review is frankly incredulous that the HGMP can only state that monitoring and evaluation plans are yet to be developed. An acceptable HGMP would include at bare minimum a clear, detailed description of a monitoring and evaluation plan, including a description of program responses to failures to attain standards directed at avoiding risk to listed species.

Note:
Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

Marblemount Winter Steelhead Program HGMP
Comments submitted by Washington Trout
August 1, 2003
Prepared by Nick Gayeski

Sections 1.7 and 1.8
This is a significant steelhead yearling smolt production program releasing 334,000 fingerling smolts from a combination of on station and offstation acclimation/release sites. (Sections 1.10 Table, page 3 and Section 1.5, page 2).

The program is characterized as an augmentation program whose purpose is to provide steelhead "for sport and tribal harvest opportunity." In addition, section 1.8 implies that "minimizing adverse effects on listed fish" is also a second (an apparently secondary) program goal. This goal needs to be clearly stated and explained in appropriate detail in this section, essentially at the beginning of the HGMP.

As in the case of all other chinook and coho HGMPs that we have reviewed, Section 1.8 fails to provide any justification for the general program purpose (harvest augmentation) or for this particular steelhead production program. Rather, it merely states some features of the rearing and release of hatchery fish. No motivation is provided in regard to the following implicit fundamental questions: *Why is harvest augmentation an appropriate or valid goal? Why does it need to occur at the Marblemount facility or even within the Skagit River Basin?* Why is it socially, economically, or biologically necessary, advisable, or even beneficial to provide fish for harvest using this program at this facility? Perhaps WDFW takes it for granted that providing fish for harvest is justification in itself, but NMFS should not have to when evaluating this program, nor, certainly, should the public.

There likely are several and varied justifications for providing fish for harvest. They should be listed and described in sufficient detail to be evaluated and weighed objectively against all direct and indirect take of listed species likely to occur as a result of the program.

Further, taking for granted some general need for "fish for harvest" provides no kind of justification for any particular program. Presumably, "fish for harvest" can be provided in any number of ways at any number of places. This is particularly true in the case of steelhead which are not a (non-tribal) commercial fish. Wild steelhead are capable of providing a significant non-tribal sport fishery under catch-and-release management, and the Skagit in particular has a viable, though recently declining, wild steelhead population that can serve this purpose, one moreover that itself may be harmfully impacted by the hatchery program in question.

This response should describe why it is necessary to produce steelhead smolts for harvest in the Skagit River basin under the specific protocols proposed – again, in order that such justification can be *weighed against* the risk of potential take that may occur, relative to other options, including discontinuing or scaling back the program. In addition the risk to the native steelhead population in the Skagit basin needs also to be weighed against alleged program benefits.

Presumably, relative to take authorization, the standard of justification for a steelhead harvest augmentation program should be higher than for a chinook recovery, preservation/conservation, or research program, or at least different. One should expect at best a very low level of biological "benefit" from a harvest/augmentation program. Therefore, a relatively high level of social and/or economic "benefit" should be described in detail in order to justify any biological risks of the program to listed Puget Sound chinook (and not incidentally to indigenous wild steelhead). The description should include information about the social or political obligation for the program, identify affected stakeholders, explain the program's success at providing the expected benefits, and/or supply numerical estimates of the economic activity that can be directly attributed to program activities.

Such benefits should be summarized here and described in greater detail in section 3.3.1. Unfortunately the response in section 3.3.1 consists of a single non-sentence stating “Skagit River and north Puget Sound saltwater (mainly west Whidbey Island) recreational and tribal commercial net fishery” (page 11).

WDFW appears to assume one or both of two things: that because the existing Marblemount Winter Steelhead Program predates the listing of Puget Sound Chinook, the “benefit” of raising fish for harvest at Marblemount has already been established, and should not require detailed explication; or that the assertion that the existing program will be run (or has been run) in order to “minimize adverse… effects on listed fish” is adequate to justify continuing the program. To be fair, guidance offered by NMFS in the HGMP template could be interpreted to imply as much. Nevertheless, Washington Trout considers both of these assumptions counterintuitive, and a misreading of both the spirit and the specific requirements of the 4d Rule and the HGMP template.

At any rate, the response for this subsection of the HGMP lacks detail sufficient to assure that the program will result in "adverse effects on listed fish" being contained within quantifiable limits that can reasonably be considered to be "safe." The mere assertion that the Department's intention is to provide fish for harvest “while minimizing adverse effects on listed fish" is insufficient.

The HGMP Template provides guidance that directs applicants to describe, “*how* the program will be operated to provide fish for harvest while minimizing adverse effects on listed fish.” (Emphasis added.) The WDFW response merely asserts that it *will* operate the program thus (in language lifted nearly verbatim from the template). In order to meet the HGMP requirement to adequately describe how WDFW will accomplish these goals, quantitative standards that provide clear threshold levels of potential adverse impact to be avoided need to be stated, and then clearly linked to quantitative monitoring variables.

Sections 1.9 and 1.10
Performance standards and indicators and associated Monitoring and Evaluation plans are listed in the Table on pages 3 – 5 titled “Performance Standards and Indicators for Puget Sound Isolated Harvest Steelhead programs”. As we have discussed in some detail in our comments on the Fingerling Chinook program HGMPs, these fail to be stated as quantifiable measures and they lack any explanation or justification demonstrating their suitability for the task that they are intended to serve.

For example, page 4 states as a Performance Standard “minimize interactions with listed fish through proper rearing and release strategies”. This is not a performance standard but more a re-statement of a program goal. A *standard* would specify a quantifiable, numerical metric that pertains biologically to one or more of the kinds of adverse impact that the rearing and/or release of yearling steelhead smolts can have on listed fish.

Be this as it may, none of the items listed under the heading Performance Indicator corresponding to the purported standard is clearly stated as an indicator nor is any one of them obviously relevant to the goal (not a standard) of minimizing adverse interactions with listed fish. A modicum of biologically relevant argumentation is required to make a case for the relevance of these items, and such argument is not made in this HGMP.

The remarks under the heading Monitoring and Evaluation Plan corresponding to this standard (“Minimize interactions with listed fish through proper rearing and release strategies") contain no measurable criteria and no actions associated with attempts to measure impacts of hatchery releases on listed juveniles. Nor do they contain or reference any timeline for changing program actions so as to endeavor to come into compliance with a *bone fide* standard.

The performance indicators listed are “[j]uveniles released as smolts”; “[o]utmigration timing of listed fish/hatchery fish – early May (chinook)/May(steelhead)”; “[s]ize and time of release – 6 fpp/ May 1-15 release and, “[h]atchery stray rates”. These are closer to being standards than they are to being measures that can serve to indicate whether or not a standard is attained.

Only the number and size of release contain measurable quantities. Most importantly, no explanation is provided that explains *how* such measurements (or potential measurements) are biologically relevant to the *goal* (not standard) of minimizing interactions with listed fish. No discussion occurs anywhere in the HGMP to describe how such putative indicators have been or will be employed in guiding and modifying program activities. No detailed monitoring plan employing such indicators and adhering to a biologically relevant timeline is described.

The associated Performance indicator of 6 fpp raises another important issue for this and all HGMPs. Fish-per-pound is hatchery management jargon and not clearly understood by the public. Moreover, where length is of direct relevance to issues such as predation and competitive interactions between yearling steelhead smolts and chinook juveniles, number per pound cannot be directly translated into length or weight without specification of the condition factor of the released fish. We therefore recommend, first of all, that the Fulton condition factor, K (=W(grams)*100/(L(cm)^3) be reported together with both the number of fish per pound and the length in centimeters or millimeters that is associated with the number per pound at the given condition factor. Second of all, we recommend that the distribution of condition factor, length, and numbers per pound be provided for all hatchery releases discussed in the HGMP. Information about the size range of released hatchery juveniles in conjunction with the size distribution of rearing and migrating listed juveniles is critical in estimating the likely adverse impacts of hatchery releases.

In brief, these two sections (1.9 and 1.10) fail to comply with the HGMP Template and NMFS guidelines for completing the Template.

Subsection 1.16
The response to the HGMP is “None”. This is clearly unacceptable and fails to comply with NMFS HGMP Template and guidance. It is incumbent on the HGMP to list and discuss reasonable alternatives to the proposed program that may better satisfy one or more of the program goals, particularly the presumably over-arching goal of eliminating or minimizing adverse impacts on listed fish! In the present case, WDFW has the additional concern pursuant to the Wild Salmonid Policy of considering and avoiding adverse impacts on the Skagit wild winter steelhead population.

Clearly, one possible alternative is to considerably reduce the size of the releases. 334,000 fingerling smolts are proposed to be released and 534,000 is implied to be the co-managers’ goal (Section 1.12, page 6). Another option would be to develop a recovery plan for wild winter steelhead which have recently failed to achieve WDFWs escapement goal. Instead, WDFW is considering simply reducing the escapement goal. A re-direction of agency focus toward wild steelhead recovery in compliance with WDFW’s own Wild Salmonid Policy with funding savings from reducing the hatchery steelhead program being invested in wild steelhead recovery measures in the Skagit River basin is certainly worth *considering and evaluating* at this point in the HGMP. This failure appears to us to be a serious deficiency of this HGMP.

Section 2.2.3
The response states, in part, that "release of fish described in this HGMP could potentially result in ecological interactions with listed species. The potential ecological interactions are discussed in Section 3.5, and risk control measures are discussed in Section 10.11” (page 9). The HGMP template requests that “annual take levels for listed fish by life stage” be provided. The HGMP refers readers to associated take table (Table 1) at the end of the HGMP (page 34) where the unintentional lethal take of juvenile/smolt is listed simply as "unknown".

No attempt is made to estimate the level of this suspected take, yet this is what is explicitly requested by NMFS in the HGMP Template and in the HGMP Completion Guidelines dated January 5, 2000. Guideline G is especially relevant:

> Under the broad definition of ESA, "take", of listed species will include hatchery activities that lead to harassment, behavioral modification, capture, handling, tagging, bio-sampling, rearing, release, competition, predation, disease transfer, adverse genetic effects, injury, or mortality of

> listed fish. When "take" of a listed species is expected in the hatchery operation, the ESA **requires** that a numerical estimate be quantified as best as possible. (emphasis added)

Merely listing "unknown" fails to qualify as providing a numerical estimate as best as possible.

Subsection 3.3
Subsection 3.3.1 of the HGMP template requests a description of "fisheries benefiting from the program" as well as "harvest levels and rates for program-origin fish for the last twelve years (1988-1999), if available." In response the HGMP merely lists “Skagit River and north Puget Sound saltwater (mainly west Whidbey Island) recreational and tribal commercial net fishery”. This response is far too cursory.

In the context of the ESA and the listing status of Puget Sound chinook, it is the alleged benefits to fisheries of program releases that are being weighed against the myriad of risks to listed fish of hatchery operations. This is especially true in the case of isolated harvest programs such as the Marblemount Winter Steelhead program. The HGMP template specifically requests data and detail to quantify an assertion that any particular hatchery program is providing such benefits.

In particular, numbers caught by particular fisheries are not provided, nor is any economic data related to catch or fishing effort reported. Yet such data is fundamental to quantifying and evaluating the benefit to fisheries that it is alleged is the principal purpose and justification for the program. It is difficult to understand how NMFS can approve an HGMP that does not present any detailed evidence to support the claim that the program produces benefits. At a minimum these must be characterized and then evaluated against the considerable risks to which yearling steelhead smolt programs subject listed chinook.

Economic data is particularly relevant in the present case in view of the statement in section 1.12 of the HGMP (page 6) that the “tribal goal for hatchery winter steelhead is to harvest 5000 adults commercially. This goal is not being achieved. The non-tribal goals are to have a self-sustaining hatchery run of 400 adults. This equates to a ~1% return on total smolt releases into the watershed (534,000 smolts).” The tribal fishing effort required to harvest 5000 adult hatchery steelhead clearly depends upon the price tribal fishers might receive for steelhead. Based upon testimony by Skagit tribal biologist Robert Hayman during Washington Trout’s litigation of WDFW in 1997 concerning the proposed building of a steelhead hatchery facility at Grandy Creek that proposed to achieve this same release level of 534,000 smolts, since the mid-1990s the price of tribally-caught steelhead has been too low to justify the effort required to harvest 5000 adults. We are unaware that this situation has changed significantly since then. It is clearly incumbent on WDFW in this HGMP to discuss such issues.

It is also important for an HGMP to note when data are lacking or inadequate to permit a reliable estimate to be made of the quantitative contribution of program fish to the fisheries that program releases are being targeted to benefit. When this is the case it would, further, seem necessary and appropriate for the HGMP to explain how the program proposes to address the problem of lack of data.

The cursory and inadequate response gives the impression that program managers believe either that it is obvious that the hatchery program provides fishery benefits that outweigh risks to listed stocks or the appropriate default presumption is that a hatchery program provides such benefits until proven otherwise. In the context of the ESA this is decidedly not the appropriate presumption. To the contrary, the HGMP process and NMFS would appear to be requesting that quantitative evidence be provided of the fishery benefits actually provided by a particular hatchery program. The HGMP patently fails to provide this evidence.

Further, the response fails completely to address the guidance in the HGMP Template that directs the applicant to explain how or if artificial production and harvest management have been integrated.

Section 3.5
Compared to the chinook HGMPs, the Coho and Steelhead HGMPs endeavor to more completely discuss issues related to nutrient enhancement, competition, and predation. Despite the additional

discussion the HGMP fails to adequately acknowledge the likelihood of risk to listed chinook from releases of yearling steelhead smolts and reflects several erroneous assumptions regarding juveniles chinook rearing and migration that are common to the chinook HGMPs.

The HGMP continues to rely upon the erroneous and dated one-third body size rule of thumb. The recent peer-reviewed published study by Pearsons and Fritts (1999) that demonstrates that coho fingerling smolts are capable of *successfully* preying upon and *consuming* juvenile chinook 46% of their own body length is mentioned and then ignored without any discussion. This is despite the fact that WDFWs own Salmonid Stock Conservation Science Unit has been developing and refining a predation model for use in assessing hatchery-related risks of just the kind at issue in this HGMP that explicitly incorporates the 46% figure as the appropriate rule of thumb! In addition the HGMP fails to mention that in the same study Pearsons and Fritts documented fingerling coho smolts attacking and *attempting* to consume and *killing* as a result of the attempts juvenile chinook up to 58% of their body length.

The Pearsons and Fritts study also reported results of other studies that evaluated steelhead predation on fingerling chinook, but the HGMP fails to mention this. The studies demonstrated the yearling steelhead smolts (which are significantly larger than coho fingerling smolts whose predation was studied) preyed upon and consumed chinook fingerlings up to 44% of their body.

At 6 fish-per-pound and a condition factor of 1 (the general target K-factor for WDFW hatcheries), the average yearling steelhead smolt would be196 millimeters long and would therefore be capable (using Pearsons and Fritts data) of consuming juvenile chinook 86 millimeters long. Even an exceptionally heavy smolt with a condition factor of 1.2 would be 185 millimeters long and capable of consuming chinook juveniles up to 81 millimeters long. These sizes are well above the range of *average* lengths of actively downstream migrating juvenile chinook in the Skagit river basin listed in Table 3.5.1 of the HGMP (page 13) even at statistical week 26, the last week in June.

During the time during and immediately following release (May 1 – 15) the average size of the largest, actively-migrating, juvenile chinook caught in the lower Skagit trap is less than 60 millimeters. Even without the proper size distribution data needed to accurately assess the predation/competition risk releases of these smolts poses to listed chinook (see next paragraph) it is more than reasonably clear that fully 100% of listed juvenile chinook rearing and migrating in the Skagit (and present in the estuary in May and early June) are capable of being preyed upon and consumed by these steelhead smolts.

Moreover, the data provided in Table 3.5.1 do not fully or adequately reflect the risk of predation by released yearling steelhead smolts on listed chinook juveniles. This data is average size data only for chinook that are actively migrating downstream. These are fish caught in the migrant traps. Smaller fish still rearing and/or not actively migrating are still present along the migration corridor. In other words, the juvenile chinook sizes from traps reported in Table 3.5.1 at best provide an index of the maximum size of chinook present that might be subject to predation, displacement, and other kinds of competition.

For both the case of actively migrating juvenile chinook caught in migrant traps and the case of non-migrating juveniles size (length) distributions need to be considered and should be provided. Even if the shape of the size distribution is assumed to be normal, there will likely be a significant left-hand tail to the size distribution containing significant numbers of smaller fish. If, as is more likely, the distribution is not normal but skewed to the right, the *mode* of the size distribution will be somewhere to the left of the mean (average) size; in this case, the length interval containing the greatest number of individuals will be composed of fish smaller than the average size. In as much as the purpose of considering this kind of data is to attempt to *quantify* the potential level of take *per* paragraph “G” of NMFS HGMP guidance, these length distributions need to be estimated and appropriately risk-averse estimates of the numbers of listed juvenile chinook of vulnerable sizes present along the migration corridor employed.

The HGMP appears to merely go through the motions of considering competition and predation of yearling steelhead smolts on listed juveniles. It relies upon assumptions such as the one-third length rule of thumb and misleading summary data (the average size data from the migrant traps) that *minimize* the potential predation and competition risks. In addition, in relying upon the one-third size rule the HGMP

ignores recent research (conducted by WDFW's own employees) that demonstrates that the one-third rule is inappropriate. After having done this, the HGMP still refuses to provide a *numeric estimate* of the potential level of take that is likely to result from the proposed releases. Even so, in the case of these large yearling steelhead smolts the capacity for predation on the majority of juvenile chinook present is considerable. This is still the case, if one were to rely upon the erroneous one-third body length rule to estimate predation capacity.

In the context of the ESA it seems clear to Washington Trout that when faced with genuine uncertainty as to a potential harmful effect of a hatchery practice -- resulting either from lack of data and lack of past research, or from uncertainty regarding biological mechanisms involved in potentially harmful inter- and intra-specific interactions -- when estimating the potential level of the harmful impact assumptions ought to be employed that risk over-estimating the level of take, rather than risk under-estimating it. In other words, the estimation process ought to be more concerned with providing reasonably high power (low probability of making a Type II error) than with keeping the probability of making a Type I error low for a null hypothesis that hatchery releases cause no take. The HGMP is simply more concerned with wrongly over-estimating a level of take from predation by hatchery smolts than it is with failing to guard listed juvenile chinook against the credible risk of take from predation by hatchery smolts. As with most of the numerous factors responsible for the decline and listing of salmonid populations under the ESA, the listed resource is forced to bear the full burden of the uncertainty. This would appear to be patently illegal.

Section 6.1
The HGMP states (page 19) that the hatchery adults collected for broodstock "are of locally adapted Chambers Creek origin and are segregated from the wild population genetically and temporally." No supporting data is provided or cited as required by NMFS. This is of particular concern in that WDFW's claim that Chambers Creek steelhead hatchery stock are "genetically and temporally" segregated from the wild population is controversial to say the least and unsupported. NMFS' own science center genetics staff among others have expressed concern over this claim of temporal isolation. Even some of WDFW's own genetics staff acknowledge unease and concern regarding this belief and its consequences for wild stock viability. In any case it requires to be supported with evidence.

In addition, the claim that the out-of-basin-origin broodstock is "locally adapted" is unsupported and, to say the least, controversial. Supporting evidence and discussion is clearly required.

Section 10.11
The response merely asserts that to "minimize the risk of residualization and impact upon natural fish, hatchery yearlings are released in May as smolts and only in the Skagit River watershed" (page 26). This response is clearly inadequate for several reasons. It simply begs the question that "minimization" is tantamount to "reduction to a level below that which constitutes take". This requires to be explained and demonstrated! As discussed above in regard to section 3.5 there is evidence for considerable risk of competition and outright predation on listed juvenile chinook from the smolt releases at issue in this HGMP.

As is common in all other HGMPs we have reviewed this refusal to seriously endeavor to quantify the level of take is indicative of a cavalier attitude toward the HGMP process and towards the genuine risk that hatchery operations can pose to listed fish. We do not see how NMFS could approve any HGMP that refuses to provide the modicum of detail necessary to characterize the risks that the HGMPs are intended to assist NMFS to evaluate and that simply appear to fail to even take the obligation to do so seriously.

The response implies that releasing hatchery smolts in May will effectively segregate the hatchery steelhead juveniles from emigrating wild chinook smolts, minimizing potential adverse interactions. This grossly over-simplifies the temporal distribution of the migration of wild listed juveniles from freshwater to saltwater habitats. Recent data on the timing of wild juvenile chinook outmigration in mid-Puget Sound rivers gathered by the Department's own Wild Salmon Production Evaluation Unit (WSPE) (Seiler et al. 2001(a), 2001(b), 2001(c), 2002, and 2003) provides substantial evidence that wild juvenile chinook

downstream migration generally occurs over a protracted period of time ranging from February to July. The majority of this data is noteworthy in displaying no pronounced mode in the timing of wild chinook outmigration. Rather, outmigration appears to be more or less continuous with several small modes scattered from mid-March to mid-June. This makes it extremely unlikely that hatchery smolt releases can be scheduled to occur after wild emigration unless hatchery releases occur after late July.

The response fails to acknowledge current work that strongly suggests hatchery and wild juvenile chinook are commingling in near-shore habitats in Puget Sound for significant periods of time before migrating to the open ocean, any attempt at temporal segregation during emigration from upstream, freshwater habitats notwithstanding. Early data from beach-seine and surface-trawl sampling in Skagit Bay in 2002 demonstrate that wild chinook juveniles of various age and size classes are present together in significant ratios throughout the spring, summer, and fall, in several types of estuarine and near shore habitats. Sampled hatchery-marked juveniles are mixed with unmarked juveniles in mean percentages ranging from 10% to nearly 60% from May through November (personal comm., Casey Rice, NMFS; 2003). During the periods that wild juveniles are present in these near shore environments, any commingled hatchery juveniles may enjoy several competitive advantages over their wild counterparts, including most significantly size, which may contribute to create a significant risk of adverse interactions and impacts to listed chinook, including competition, displacement, and predation. WDFW is aware of these preliminary findings and should understand their implications. These data, while still inconclusive and not directly related to steelhead presence (wild or hatchery) in nearshore habitats, should warrant some discussion and analysis in this context, insofar as WDFW is asserting that it can successfully minimize adverse impacts to listed Puget Sound chinook by effectively segregating listed chinook juveniles from hatchery juveniles of all species during freshwater out-migration and rearing life stages.

Section 11.1
This response in this and the following section is completely identical to the response provided in the HGMP for the Soos Creek Coho program. There is, in other words nothing that is specially crafted for the Skagit basin or that is intended to address the unique aspects of a yearling steelhead program. We are forced, therefore, to repeat our comments to that response.

The response consists principally of assertions that the co-managers intend to conduct some “ongoing monitor (sic) programs, including catch, escapement, marking, tagging, and fish health testing” and statements of intentions to conduct future research on aspects of juvenile salmon ecology and research to assess the risks of predation on listed species by hatchery coho and steelhead. While this is surely well and good, it fails to address in detail the specific performance standards and indicators listed in section 1.9 and 1.10. Such an endeavor is surely hampered by the fact noted in our comments on those sections that no *bone fide* standards or indicators are provided.

What seems to be required here and is fundamentally missing is a detailed description of the kinds of monitoring currently going on or planned to occur in the immediate future with regard to specific quantitative standards and indicators, especially those pertaining to risk of harm to listed fish. Without a clear account of what kinds of things need to be measured and what the target levels of each are, it is impossible to understand what features or practices of the program could be changed in order to bring about compliance with target levels (standards). Without knowledge of what *could* be changed in order to bring about achievement of (compliance with) a standard neither NMFS not the public can attain a clear idea of what *would* be changed. Absent this, there simply are no standards.

The mere statement of the intention to monitor or conduct research without any substantive details is not in any way an equivalent or an acceptable substitute for a clear quantitative monitoring plan, which specifies both the kinds of program changes that will occur or will be evaluated in response to specific monitoring data and the *period of time* within which such changes will occur and quantitative threshold performance standards will be achieved. The HGMP provides no such detail. It effectively describes no monitoring plan and it has no timelines.

Section 11.2

The fundamental shortcomings noted under section 11.1 are further evidenced by the response to this section, which consists entirely of the statement that "[r]isk aversion measures will be developed in conjunction with monitoring and evaluation plans" (page 26). In other words, there currently are *no* risk aversion measures because there currently appears to be no detailed monitoring and evaluation plan.

This is more than a little disturbing. It would seem to reveal that the implicit program goal suggested in section 1.8 of "minimizing adverse genetic, demographic or ecological effects on listed fish" is not an operative goal or objective at all. The response clearly and simply suggests that there are no currently operative risk aversion standards regarding adverse impacts of hatchery practices on listed fish.

Risk aversion measures should be *implicit* in the specification of quantitative performance standards and indicators, if not explicit! If clear quantitative performance standards and indicators were provided in sections 1.9 and 1.10 as required by NMFS in the HGMP Template and associated Guidance, the appropriate risks to be avoided would be implicitly those required in order to attain the standards. Attainment of the standards, in turn, is evidenced by the attainment of specific levels in the indicators which figure directly in monitoring plans. The monitoring and evaluation plans would be structured by the very statement of quantitative standards and indicators. NMFS requires that these be articulated in section 1 of the HGMP.

This review is frankly incredulous that the HGMP can only state that monitoring and evaluation plans are yet to be developed. An acceptable HGMP would include at bare minimum a clear, detailed description of a monitoring and evaluation plan, including a description of program responses to failures to attain standards directed at avoiding risk to listed species. We do not believe NMFS can credibly approve any HGMP that is fundamentally incomplete in this regard.

Note:
Where in any other individual HGMP the responses to the specific sections cited above are substantively similar to those evaluated here, or fail to adequately provide the types of required information identified in this review, then those elements of these comments that can be reasonably applied to those responses should be applied, and responded to in the context of that individual HGMP.

CONCLUSION

The HGMPs by and large share a central flaw, a general unwillingness or inability to adequately quantify estimates of the harm the individual programs may be doing to natural chinook populations in Puget Sound, or estimates of the benefits the HGMPs claim derive from the programs. Levels of take are consistently characterized as unknown. Levels of benefit are described in cursory, vague language, generally as “fish for harvest.” Important information about how many fish, caught where, by whom, and at what total value, is rarely if at all provided in sufficient detail. Few adequate standards, targets, or thresholds are offered for either harm or benefit. Efforts to determine and/or monitor levels of harm and benefit, standards for each, or any measures or timetables to meet those standards are not adequately described.

Several fundamental issues must be reconciled in any application for take authorization. What level of take would be authorized? What types of benefits can the level of take be weighed against? What is the difference between current levels and any appropriate standard for those levels? How were those standards determined? How will they be met, when, and how will those efforts be monitored? Failing to provide this important information creates uncertainty that could provide the potentially inappropriate implication that the level of harm is lower than it actually is, and the level of benefit greater. The overall scope and scale of the Puget Sound chinook hatchery program is simply too large to responsibly accommodate the level of uncertainty presented in the HGMPs.

Given these significant shortcomings, this review finds the applications apparently inadequate to justify take authorization under the criteria enumerated in the 4d Rule. We are compelled to suggest that WDFW withdraw many of the applications for redraft, if it can provide the necessary information. If the necessary information is unavailable at this time, we suggest that WDFW reconsider some of the particular programs, either discontinuing or significantly scaling them back until it can provide pertinent information adequate to warrant take authorization.

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08/01/03

Attached is a letter to Dr. Jeff Koenings with the comments of the Steelhead Committee of the Federation of Fly Fishers on the draft HGMP's of the Department of Fish & Wildlife.

Attachment on the Following page

Dear Dr. Koenings:

The Steelhead Committee of the Federation of Fly Fishers concurs with the comments of Washington Trout on the draft HGMP's prepared by the Department of Fish & Wildlife. We are particularly concerned about the Skagit River HGMP and the Department's hatchery steelhead programs for the Skagit, which seem to fly in the face of both the latest and best science on hatchery operations and the previous court ruling on the Grandy Creek hatchery.

08/01/03

The HGMP prepared by WDFW for the North Fork Nooksack Chinook Program is inadequate.

The conservation organization Washington Trout has posted to its website [www.washingtontrout.org] a series of Comments that it has prepared to HGMP's submitted by WDFW for other Chinook production facilities. This reviewer incorporates by this reference those portions of Washington Trout's Comments which address generic or common responses prepared by WDFW's to the HGMP Template for Chinook facilities.

This reviewer has also submitted separate Comments regarding the HGMP submitted by WDFW for its Kendall Creek Coho Program. Those comments are also incorporated herein by this reference.

Further Comment - The information included in the HGMP "should be the best scientific and commercial information available, as it will help determine if hatchery programs are likely to meet their goals and ESA obligations." [Guidelines, Part A]. The SASSI report lists Nooksack wild spring Chinook as "critical", and more recent data have simply confirmed how desperate the plight of these fish actually is. WRIA #1 has adopted a comprehensive interim salmonid recovery plan which has been approved by the regional Co-managers, as well as an on-going Watershed Planning process established pursuant to HB 2514, under which a vast body of high-quality fish presence and fish habitat data, along with water quantity and water quality data have been compiled. While these data clearly represent the "best scientific … information available", almost no reference to such information appears in this HGMP.

Specific Inadequacies:

Specific failures and inadequacies contained in this HGMP are addressed immediately below, by Section number and title.

1.4) Funding source, staffing level, and annual hatchery program operational costs.

Comment - No cost data are supplied. Sadly, this HGMP is not unique in this regard. This reviewer has examined at least half of the HGMP's submitted by WDFW and its affiliates, and not one of them contained any such data. Such data clearly exist. One wonders whether this failure results merely from indifference, or whether WDFW is attempting to conceal from the public the large costs of its hatchery system.

1.5) Location

Comment- The location of at least two of the remote sites has been problematic. The Kidney Creek site was located well above an anadromous barrier; this reviewer has observed Chinook pre-smolts up to 6" in length remaining in Canyon Creek until mid-August in years past; presumably they were feeding on native char, which are the principal wild salmonid inhabitants of the receiving waters.

1.10) List of program "Performance Indicators", designated by "benefits" and "risks."

Comment - The local Co-Managers now tacitly recognize that the North Fork Spring Chinook program has caused adverse ecological impacts on conspecific wild chinook. A bit of background is in order. The South Fork Nooksack Spring Chinook are currently listed as the top priority stock for protection under the WRIA No.1 Interim Salmon Recovery Strategy. A risk of harm to wild stocks may always be anticipated from hatchery fish straying into the spawning grounds of wild conspecifics. Such straying is widely recognized as posing risks of harm at rates exceeding 4%. A program that produces high numbers of strays needs to be "tweaked" in proportion to the magnitude of straying.

The footnote to Section 2.2.2 of the HGMP shows the magnitude of possible harm that may have resulted already from this program: Ned Currence, Nooksack tribal biologist, is cited as authority for the

fact that “(i)n 1999 and 2000, 55.6% and 32.4%, respectively, of the carcasses surveyed in the SF Nooksack were strays from the NF Nooksack Kendall stock rebuilding program”. The allowable limits for straying have been exceeded by orders of magnitude.

The risks from such interactions are not inconsequential. They include genetic damage to conspecific wild populations through interbreeding, or from elimination of wild conspecifics through redd destruction by later arriving hatchery pairs.

This is a section of the HGMP template that really cries out for numerical analysis, in order to satisfy the requirements of the Instructions. No such analysis is provided. This Section is clearly insufficient to support acceptance by NOAA.

1.11.2) Proposed annual fish release levels (maximum number) by life stage and location.

Comment – The footnote to the table presented by WDFW gives a hint at troubles in this program. Interestingly, the HGMP admits that the “Program production/release strategies have been re-evaluated and decreased from 600,000 to 400,000 to 150,000 on-station release. 200,000 to be planted in the MF Nooksack (2002).” This statement hangs in a vacuum. If the HGMP were truly the "single, comprehensive source of information" regarding this hatchery program, as required in the Instructions, further information would have been provided as to why WDFW agreed to such a dramatic curtailment of its program. We can infer that these reductions have been considered in relation to the straying problem identified in my Comments to Section 1.10 above.

1.16) Indicate alternative actions considered for attaining program goals, and reasons why those actions are not being proposed.

Comment- it is refreshing that WDFW contemplates some alternative actions.

Given that the Nooksack spring Chinook population is the most northerly population or stock of listed Chinook in the Puget Sound ESU, management efforts to protect this stock must be highly sensitive. Perhaps other stocks in the ESU could go extinct and not harm the overall viability of the ESU, but that cannot reasonably be argued with respect a population which defines the northernmost edge of the spatial range of the ESU.

Given the sensitivity of the Nooksack stock, ALL possible adverse impacts from hatchery operations should be examined for their possible adverse impacts. See especially this reviewer’s Comments on the HGMP submitted by WDFW for its Kendall Coho Program, including both risks associated with that program and also with the Lummi Skookum Creek Coho Program.

SECTION 2. PROGRAM EFFECTS ON ESA-LISTED SALMONID POPULATIONS.

2.2.1) Description of ESA-listed salmonid population(s) affected by the program.
- Identify the ESA-listed population(s) that will be directly affected by the program

- Identify the ESA-listed population(s) that may be incidentally affected by the program.

To its credit, WDFW does describe in some detail the ESA-listed populations that may be impacted by this hatchery program.

2.2.2) Status of ESA-listed salmonid population(s) affected by the program.
…..
- Provide the most recent 12 year (e.g. 1988-present) progeny-to-parent ratios, survival data by life-stage, or other measures of productivity for the listed

population. Indicate the source of these data.

To its credit, WDFW provides some data in this regard, although those data are now largely out of date. The data produced, however, demonstrate the dire plight of the wild component of the Nooksack spring Chinook run, which is returning at much lower than replacement values.

For the North Fork, wild / hatchery ratio for 1995 to 1999 = .31:1 average (range 3.3:1 to .11:1). The recruit / spawner ratio range for 1995 to 1999 = .00000 to .53333 fish per spawner.

While the HGMP states that there are "limited data for the South Fork wild/hatchery ratios in these categories," there are actually newer data which show that the wild South Fork population has been overwhelmed in recent years by returning adult Chinook of Kendall hatchery origin straying into historic South Fork spawning beds. In a footnote to Section 2.2, WDFW notes that in 1999 and 2000, 55.6% and 32.4%, respectively, of the carcasses surveyed in the SF Nooksack were strays from the NF Nooksack Kendall stock rebuilding program.

This danger has been fully understood by Nooksack basin Co-managers. The Nooksack Tribe's chief biologist, Bob Kelly, recently wrote a letter to the "salmon recovery" community in WRIA #1, which contained the following language:

> We have concerns {that the adult Chinook return statistics} misrepresent the extent of the dire situation of the North/Middle Fork stock, as well as the extent to which we are approaching recovery. Only wild chinook (those that were naturally spawned) are considered in evaluating progress towards our recovery goals, and 94% of the 3,687 adults originated from the hatchery. Similar to numbers for the South Fork early chinook, the number of naturally produced North/Middle chinook is closer to 200. In fact, the Kendall hatchery program releases are being reduced, because, once again, we had a high percentage of Kendall origin North Fork chinook which strayed to spawn in the South Fork (over 50% of South Fork early chinook spawners). With only about 200 wild chinook returning, rather than 3,687, we don't want people to be misled about how far we have to go to reach recovery, and the extent of habitat improvements that are needed for us to achieve this.

WDFW needs to adopt real Monitoring and Evaluation programs designed to determine why the products of its Chinook hatchery program are faring so much better than their wild counterparts. Ecological interactions between the two cohorts are now clearly suspect among the local Co-Managers. WDFW needs to explicitly state that this is the case and describe how it intends to address these issues.

- Provide the most recent 12 year (e.g. 1988-1999) annual spawning abundance estimates, or any other abundance information. Indicate the source of these data.

Comment - The HGMP acknowledges that a huge proportion of South Fork Nooksack spawners have been identified as being strays from the NF Nooksack Kendall stock rebuilding program. See comments above for Section 2.2.1.

2.2.3) Describe hatchery activities that may lead to take of listed fish in the target area.

_____

- Provide information regarding past takes

Comment - The information provided in this Section completely avoids any discussion of ecological interactions between hatchery and wild chinook.

- Provide projected annual take levels, quantified..

Comment- The reference to the "Take Table" merely defers the reviewer's continuing disappointment. The information contained in the "Take Table" merely re-states the common theme of lack of knowledge. Parenthetically, the Take Table itself contributes to the poor quality of the responses present in this HGMP. Its matrix contains no cells for species interactions or the other sorts of hatchery-related harm to listed species that are commonly understood among competent scientists.

- Indicate contingency plans for addressing situations where take levels within a given year have exceeded, or are projected to exceed, take levels described in this plan for the program.

Comment – The contingency plans identified in WDFW's response are nonspecific and fail to address ecological interactions between the hatchery Chinook and their wild counterparts.

SECTION 3. RELATIONSHIP OF PROGRAM TO OTHER MANAGEMENT OBJECTIVES

3.4) Relationship to habitat protection and recovery strategies.

Comment- Interestingly, WDFW's response actually contains nuggets of understanding that the operations of this facility pose risks of harm. The text of the response is set forth, with that revelatory language highlighted:

> Hatchery production is supplementing natural production while efforts for habitat recovery programs are on-going. There is a significant effort underway to identify factors limiting the survival of natural-origin spawners in the North Fork Nooksack River. As habitat recovers, and natural spawners become productive, the hatchery component of this program will be scaled back accordingly. WDFW and the co-managers will consult with NMFS to determine the protocols for scaling back the hatchery production in a manner which most efficiently promotes the recovery of the natural spawning population. This will be done while maintaining sufficient reserves of hatchery broodstock to ensure protection against sudden reversals in natural spawning population survival. A Watershed Recovery Plan is being developed and this program is an essential factor in this plan.

3.5) Ecological interations-

Comment - WDFW's response deals only with competition at the smolt-to-smolt level, and glosses over important considerations more completely identified in Washington Trout's Comments to Chinook Program Hatcheries. Further, the HGMP completely ignores the very real and substantial ecological interactions between these cohorts as adults, as they compete for mates and spawning grounds. This is a section where WDFW could have drawn together missing threads from other sections, to create a HGMP which could support approval by NOAA. Its failure to do so is highly unfortunate under the circumstances.

The public is entitled to more information than is provided in this HGMP, and our listed Nooksack Spring Chinook deserve better protection than that afforded in this HGMP. Instead of using the best currently available information and science.